LANDMARKS for the USER EXPERIENCE in the CLOUD
Landmarks for the User Experience in the Cloud
Foreword
Introduction
Key concepts
Part 1: Living in the Cloud
  People don’t really care about the Cloud (as long as it works)
  People will use services they want, even when their security is threatened
  Sociability is a main ingredient of Cloud services
  A tale of empathy and elderly care
  People are not sharing photos, they are reliving memories
  No service is an island
Part 2: How to create Cloud services with superior user experience
  Design for evolving user practices in the Cloud
  Stories are windows to people’s everyday needs and experiences
  Wow your users, but provide long-term benefits
  Multi-device access should support seamless service UX
  Ubiquitous technologies enable new forms of social interaction in the mobile Cloud
  The Cloud provides new opportunities for UX methods
  UX work can be lean
  The UX journey may be a bumpy road
  Organisational culture will foster successful service development: Case Flowd
Part 3: Creating business from Cloud user experience
  Cloud is both a technology and a business model
  Experience is a viable differentiation strategy
  Customers want you to support their values
  Consumers are willing to pay only for the critical Cloud services
  Expanded UX capabilities create opportunities for customer experience business
  Brand image can help in setting UX goals
Cloud UX Design Case: Goods Spotter
Cloud UX Design Case: Liquid User Experience
Concluding words
Biographies of the authors
Most of us are nowadays using the Internet in a very different way than, say, ten years ago. Comparing to the children who have grown up with Google, Apple, Angry Birds and Facebook the change is even more fundamental – they are not using the Internet, they are living in the Internet - the virtual life is their life in reality.

Great user experience is critical as we all are facing new services and applications almost every day. With multiple choices around it is extremely easy to dismiss a new service if there is something discomforting in it. Also, not many of us would install an app that is not among the top rated apps in its category – would you?

Digile’s Cloud Software program has approached Cloud from a holistic perspective. Thinking about Cloud technologies alone is not enough. You also need to (re)think about your business and how the new cloud-enabled reality will influence the entire organisation that intends to be successful in this new environment. From the very beginning of Cloud Software program User Experience was chosen to be a special spearhead in this transformation facilitating competitiveness, and in some cases – survival of the organisation.

I am very excited to see that the great wealth of expertise and experience on User Experience from the Cloud Software program consortia has now been condensed into this easy-to-read, easy-to-use book. I am especially delighted to see that this book provides hands-on, practical advice to help people to build the best possible user experiences – sometimes hopefully even reaching the elusive ”Wow” effect among their recipients. I believe this book can help readers with different backgrounds rethink their service development and business, based on thorough understanding of user experience in the Cloud.

7.11.2013, Vilnius

Janne Järvinen
Focus Area Director
Cloud Software Finland
Director, External R&D Collaboration
F-Secure
Cloud services are used daily by millions of people in their different life contexts for communicating, content sharing and storage, gaming and media consumption. The way people perceive and experience Cloud services is critical to user acceptance and eventual success of these services. As technology developers and service developers, we need to design these services to enable meaningful, fluent, pleasant and rewarding use.

Much of past literature about the Cloud has focussed on the technological development of the service infrastructure. While this is very important, we need work on a parallel human-centred stream with the focus on the user, the human, not just the technology. This is what user-experience work is about: understanding what people need, want, desire – and what fits their life practices.

The four years (2010-2013) of the Finnish Cloud Software Program resulted in rich explorations and innovations in the area of user experience and service design in the Cloud. Based on that work, this book has three main parts. The first part sheds light on people’s perceptions of the Cloud – what it means to them and how they “live” in the Cloud. The insights of this part provide a basis for understanding what kind of service user experience (UX) is needed to support to users’ practices. The second part takes the developer’s...
viewpoint and presents issues which can help develop successful Cloud services. The last part discusses how UX can give rise to new business and better business in the Cloud. Finally, the book presents two multiphase case studies, conducted as part of the Cloud Software Program. We believe that together these parts provide “landmarks” to what is important in Cloud UX development.

This is not an academic book. We envisioned a more practical purpose and several target audiences for this book: Product managers of Cloud services, UX managers, top managers, students studying subjects related to Cloud development, and so on. The focus of our work has been on consumer services, but we believe most of the ideas and claims presented in the book are applicable also for business services. We hope the contents are inspirational, opening new perspectives on what it means to develop the Cloud for the people, at the same time creating viable business based on user experience.

The authors are introduced at the end of the book. Also, read the concluding words about how we wrote the book – in the Cloud. We thank all authors warmly! It was a nice experience of working together, in a rather social manner, to create a new piece of media content. The outcome is in your hands, and we hope that you are enjoying it!

In Tampere and Oulu on October 1st, 2013
Kaisa Väänänen-Vainio-Mattila and Sari Vilminko, the editors

Key concepts

In this book, we use terms related to the Cloud and user experience (UX) in the following way.

The Cloud is a paradigm for service design and delivery in which remotely located services are offered to end-users through heterogeneous computer networks. Users can access Cloud services and the associated digital content, such as photographs, music, email and other files, with various devices at any time and anywhere. The Cloud also enables versatile functions for social activities such as content sharing, commenting and real-time communication.

Examples of Cloud services intended for consumers are Gmail (emails are stored on an Internet server instead of the user’s computer), Spotify (almost unlimited music libraries can be accessed through the Internet), and Facebook (personal information, photos, games, etc. are shared with other Facebook users). Industry and the public sector also use Cloud services to manage their functions, such as logistics, financing and other aspects of enterprise management.

User experience (UX) refers to the end-users’ perceptions of the interaction with the system. These perceptions include effectiveness – how good is the outcome of using the system?, efficiency – how
fast or effortless is it? and emotional satisfaction – how good does it feel to use it? (Kuniavsky, 2010). UX is dynamic; it changes over time, and is affected by the user’s values, needs and expectations. To offer a good UX, a system must have the right functionality and be easy and attractive to use.

By Cloud UX we mean the users’ perceptions and feelings while using Cloud services. Cloud UX is affected by both the meaningfulness of the functionality and interaction design of the service. UX factors which are specific to Cloud UX include social functions offered by the service, the feeling of trust and privacy, and seamless access to different functionalities from various devices. Cloud UX is not a separate entity from the end-users’ experiences with other technologies, but all services, applications and devices together form a basis for the technology experience in people’s everyday lives.

In this book, our focus is primarily on the consumer services. However, many of the insights gained from our studies and the claims made in this book are also applicable to enterprise services and users.

Further reading

www.allaboutux.com


The Cloud is for people. Only when the end users start actively using the services, the Cloud becomes alive. The eventual purpose of Cloud software development is to improve people’s lives, their practices and experiences in both leisure and work. We must be conscious to the needs, wants and expectations of the end users when we talk about development of the Cloud technologies and services. The first part of this book will shed light to how Cloud services are perceived by people who use – or in some cases decide not to use – them. Based on the rich set of user studies we have conducted in the Cloud software programme, we present insights on end users’ perceptions of the Cloud services, their security and social interaction possibilities. Finally, we emphasise that new Cloud services always enter a situation where people are already using other services and thus individual Cloud services need to be considered as part of a larger set of services. Eventually, users’ preferences and how the services address them will decide on the success of the Cloud services.

Part 1: Living in the Cloud
People don’t really care about the Cloud (as long as it works)

There’s not actually a big difference between the internet and the Cloud in people’s minds. When we did our first international studies back in 2010* and asked whether people knew what Cloud services were, the results were remarkable: only 20% of people had even heard the term “Cloud service” before, though almost everybody was using Cloud-based services such as webmail, YouTube and Facebook. Notable also was that only 4% of respondents considered themselves as advanced users of these services. Today the results would probably look very different. In just a couple of years, the situation has changed drastically to a time where the Cloud is more and more the status quo than a peculiar exception. Even so there are still people who do not always realise whether their data is located on their local computer or in the Cloud. These people have an absolute right to feel this way; the technology should be transparent and reliable. To have good UX in the Cloud, the services should provide people with the freedom not to think about the actual location of the data. They just want to know that it is available when needed. The awareness of the Cloud varies a lot over time, but also between people. People who are more technically oriented, or whose business or “life” depends on their data, rely on the Cloud as an extra back-up method.

For many users, Cloud is a very positive phenomenon because it allows data to be backed up automatically. This provides the feeling of safety/security. Many people are also more sensitive about privacy issues. They may encrypt their sensitive data or avoid storing it on services they don’t fully trust.

The situation changes drastically if the Cloud services cannot be reached for some reason. Even though nowadays in most modern environments there is readily available internet connection, there are situations when no network is available. Also, even when the connection works, the actual Cloud service may be down for technical reasons, hacked or just busy. These are definitely the challenges Cloud service providers need to solve. To maintain user satisfaction with the service and the willingness to adopt the service for one’s work or private life depends on the solid and reliable functioning of the service.

*June 2010 online survey about people’s perceptions of Cloud services and their usage around the world (USA, Japan, Finland, n=3191)
The tale of how the Cloud fixed the problem of contact book synchronisation

Just a few years ago people used to have problems managing and moving contact and calendar information from one device to another. For example, one user reported that he had stopped using devices from a certain brand after having two cases of losing his contact information when the system made an unsuccessful data synchronisation, before using a Cloud service for this purpose.

Now this seems to be much easier with many working Cloud services offering help for the situation and devices supporting several of these services. However, the majority of users do not distinguish between whether their data is in the Cloud or on their devices, if it just works. And when they do make the distinction, most of the time it creates a positive feeling of safety, to have a duplicate of their data in the Cloud in case their device gets lost or seriously broken.

Our studies showed that Cloud services are seen as beneficial; especially, the independence of time, place and a specific device is important for users. People are not very interested in how a service is provided to them, as long as it provides sufficient value. People do realise there are some security and privacy risks but even the reported privacy issues have not stopped people from using Cloud services. Even the services that are perceived as not so trustworthy are used because the benefits are seen to be greater than the possible security or privacy breaches. Even the challenges related to security and service reliability do not prevent the adoption and use of these services when the motivation for using the service is otherwise high.
In our studies, privacy was perceived as important and participants had thought a lot about their online identity and its protection. Many participants were extremely careful about the information they revealed within various applications in the Cloud. Password and user account management was seen as very challenging when people have adopted several different services.

It was obviously important for participants to be able to store, share and use their files wherever and whenever over the network. However, even when there are specific services in the Cloud designed for this purpose, those were used surprisingly little. People rather stored and shared their data through services that they were used to using daily in any case, such as Facebook, webmail etc.

“I have shared my photos via Facebook; there is a massive amount of warnings about its insecurity but one has to trust and believe in something.”

“I have given very little information about myself right from the beginning because I understand that managing those afterwards is impossible.”

There were also examples of creating a new, fictional, network identity.

“According to Facebook I am 13 years old at the moment. I have read that my profile is better hidden that way.”

It was clearly visible that if there was an adequately strong motive or pressure from outside for registering oneself for a certain service, trust issues had little or no significance when deciding to join.

“I think that the biggest reason for the desire to join a certain service is that a community or group that you belong to is already using that service.”

“A service can be unreliable as long as the benefits are greater than the harms. If for example someone downloads my picture from Facebook, that is not that harmful compared to the possible benefit of allowing my friends to recognise me.”

Even if some people behave seemingly carelessly in the Cloud services, it can be assumed that in the long run those services that ensure good security and privacy will have a competitive advantage over the ones in which people do not feel safe.

---

ToolBox: Owela enables dialogue with your customers

Owela (www.owela.fi) is an online innovation space that enables direct contact, active participation and continuous dialogue with end-users. Owela helps companies to co-design new products and services as well as improve existing ones together with consumers. It supports active user involvement in the innovation process, from the first ideas to piloting and actual use. The Owela studies are flexible and customisable and can involve e.g. online discussions, commenting, blog posting, idea posting, surveys and chat sessions. Owela has been developed by VTT since 2007 and includes an active “Owela community” of people interested in sharing their opinions and ideas. With VTT’s expertise in facilitating online co-design and the Owela platform, companies are able to be in direct contact with their potential customers throughout the innovation and design process, benefiting from the quick access to feedback. Owela helps companies to understand end-users’ lives and experiences, increase the quality of products and bring them faster to market.
Sociability is a main ingredient of Cloud services

Sociability is a fundamental part of being human. Sociability includes feeling connectedness with others, achieving esteem, or sharing emotions or experiences with others. The Cloud enables versatile ways to support social activity through sharing, commenting and communicating with other users. Sociability is very often the main reason for starting to use a new Cloud service, e.g. in order to share content with a friend or to get connected with some special group interested in similar issues. Even when sociability is not the primary reason for adopting a new service, it can still bring the critical extra value needed to maintain new users.

Further reading


An example of the power of sociability comes from the area of Cloud storage services. Although these services are particularly handy for a user wishing to synchronise files between many personal devices, the reason why many people start using such a service is that a friend asks to share something, or advises that this particular service would be useful.

When we studied the stories behind using Cloud storage services, such as Dropbox, we found, for example, a student who had just started his university studies and needed to get his bills sent to his old home address. So he started using a Cloud storage service with his father to get scanned documents in his account. Soon he started sharing photos about his campus life with his parents via the same service, and sharing work documents with his co-students when working on different course assignments. Eventually he also used the service for syncing files between his devices and also to reach the files when using a public computer at the campus.

Once a person has created a web of connections with his close ones through a certain service, they will very likely keep on using the service because these connections are the primary value that the service offers to them.

**Business motivation from sociability**

Six of the top 10 global websites (as ranked by web analytics company alexa.com) have substantial embedded social element. However, for new social sites it is difficult to retain users. The business motivations for supporting sociability in various contexts are manifold: First, rewarding social interactions encourage people to come back to the service, and to use it more often. Second, if a current user has positive experiences with a service, they may recruit new users to the system. If the system then supports some social interactions with these friends, the user gains social capital in that particular context, and the value of the service to that user increases. Third, services that support cooperation between users to achieve common goals may increase the efficiency of task performance.

**How to support sociability in Cloud services**

Sociability can be expressed in different service types in various ways. Successful social services help their users to find interesting new connections, strengthen current connections and create serendipitous (new, unexpected) interactions.

In Figure 1 below we present five essential features recognised in the literature as supporting social actions (Hanrahan et al., 2011). In addition, we suggest that it is important to present other people’s presence to other users by presence indicators.

**SOCIAL FEATURES**

- Tagging - support finding and sharing content
- Activity Streams - commentaries on users’ actions - effective for discovering context
- User Presence - presentation of user’s current status and immediate activities - possibly creating a real experience of presence
- User Profiles - provide users their identity and aid in discovery of common interests and initiating relationships
- Comments - the primary conversational medium often expressing social relationships
- Ratings and Votes - fundamental component of reputation systems - facilitate interaction, trust, and limit abusive behavior

**SOCIAL ACTIONS**

- Social Browsing & Search
  - Who’s watching the same channel?
  - Who’s in presently
  - Who’s coding the related code
- Interaction
  - “What do you think of this show/tune?”
  - “Do you see that we both own the same tune?”
- Sharing Content
  - Links adding value to a TV show
  - Photos from a shared experience
  - Links to manuals
- Collaboration
  - Playing a proximity based game
  - Writing the same piece of code together

Figure 1. The central social features and actions that they support with examples from contexts of Social TV, Social Devices and Collaborative Coding
Above we briefly present three service prototypes from different contexts to illustrate various considerations that are based on our studies on Social TV (Palviainen et al, 2013b, see Figure 2), Social devices (Palviainen et al 2013a), and Collaborative coding environment CoRED (Lautamäki et al 2012).

The Cloud is an excellent platform for supporting interactions and connectedness between people through digital services. Many successful services have been leveraged from these features and capabilities and this will create strong long-term motivation to use those services.

Social Television
In Social TV, the purpose of the system is to support the following user needs:
- knowledge of presence of the others, including information about the activities of the others
- co-ordinating shared activities, e.g. support for setting up a session of watching a show together
- communication about the TV content (or any random topic) and
- the possibility to see the preferences of the others, e.g. likes/dislikes, recommendations, info about what the user is planning to watch and watching history

For example, presence can be expressed simply by showing who is online and what channel they are watching. In many cases that may be enough social features. Different TV content is watched in different ways. Watching drama requires as little disturbance as possible from friends online, while reality TV shows typically suit continuous commenting and chat. Recommendation systems help users to find content the others have found interesting while they also function as promoters for the content, increasing the use of the system and the user commitment as well as potentially increasing the sales of premium content delivered on the Social TV platform. When using the prototype that had features described here, the most positive comments were provoked by showing the presence of others and integrating some humorous elements to present phatic responses (like laughter or cheering).

Social Devices
The idea of this concept is mainly to increase social interactions in close proximity, that is when people are only a few metres apart. Many users found the most promising feature to be the one pointing out items of mutual interest for users. However the benefits of this type of feature must be balanced with the risk of disturbing other social interactions that may be ongoing. The system needs to exhibit some degree of proactiveness in order to offer positive experiences for users.

For example, presence can be expressed simply by showing who is online and what channel they are watching. In many cases that may be enough social features. Different TV content is watched in different ways. Watching drama requires as little disturbance as possible from friends online, while reality TV shows typically suit continuous commenting and chat. Recommendation systems help users to find content the others have found interesting while they also function as promoters for the content, increasing the use of the system and the user commitment as well as potentially increasing the sales of premium content delivered on the Social TV platform. When using the prototype that had features described here, the most positive comments were provoked by showing the presence of others and integrating some humorous elements to present phatic responses (like laughter or cheering).

Collaborative Coding
The main benefit of using a collaborative developer tool is an integrated and real-time opportunity to communicate about the artefacts under construction and to see what others are doing. The users reported that they felt more motivated to continue with their tasks when they had a way of experiencing the presence (either virtual or real) of their peers. Also seeing the advances of the whole team in the work at hand in real time lifts the spirits. On the other hand, coding requires often deep concentration which should not be disturbed by the social elements of the system.

Figure 2. An example screenshot of Social TV prototype developed with Telia Sonera.
A tale of empathy and elderly care

The value of empathy between families and relatives and friends is an example of the increasing business impact that sociability can provide. For example, technology for elderly care can create huge potential in business as well. IBM service concepts are a good example of this new type of service and the need for such services is increasing (see http://www.adweek.com/news/advertising-branding/ibms-long-form-content-shows-its-technology-action-148156).

Elderly people’s independence and the opportunity to continue living in their own homes is a great value for them and their families. Respecting this value will create huge business potential. Emotionality related to sociability and care will be a central factor for creating successful Cloud services in the future. Fluent interaction, beautiful design and great usability have become generally available in many services, but novelty based on sympathy and empathy has further potential in Cloud services. Companies who understand and realise these opportunities to touch users’ emotional values and understand societal trends have immense opportunities to achieve business value based on this thinking.

Further reading


Palviainen, J., Suhonen, K., Väänänen-Vainio-Mattila, K., Aaltonen, T. Exploring Usage Scenarios on Social Devices – Balancing Between Surprise and User Control, in proceedings of Designing for Pleasurable Products and Interfaces, DPPI’13, 2013a, ACM.

Palviainen, J., Kuusinen, K., Väänänen-Vainio-Mattila, K., Aaltonen, T. Designing for Presence in Social Television Interaction, in proceedings of Mobile and Ubiquitous Multimedia MUM’13, 2013b, ACM.
People are not sharing photos, they are reliving memories

Our studies show that the first experience of Cloud services usually relates in some way to sharing and storing photographs. It quickly became obvious that the reason for uploading photos to the Cloud was related to the need for sharing them with friends and family or collecting photos from several different people into a common repository. For this reason, sharing has become a huge opportunity to enrich the user experience and widen the opportunity to touch people on an emotional level. After studying people’s thoughts about digital content through narratives, i.e. stories about everyday life, we realised that it is essential to understand what people are actually sharing, when they are sharing photos through the Cloud.

So, when people are sharing and storing photographs, what is really been shared and stored? The answer is memories and experiences. Hence, people are looking for an emotional and social experience when they share and store photographs. What they want is to relive the memories and experiences through the photographs. People also want to give others, either close friends and family or random people at large, the opportunity to be part of their experiences and be able to relive joint memories collectively. Following on from this, it is easy to see why people are requesting more interactive features related to photo sharing.

This desire for collective reliving of memories opens up many opportunities to create meaningful experiences on top of mere image-sharing services. This type of breakthrough can be reached by enriching the sharing experience by using intelligent ways for building new elements on top of simple sharing features. Some examples of such elements in existing services are:

When people are sharing photos through the Cloud, they actually want to relive their memories with others.
• the opportunity to add information to content at the moment it is created and later on (e.g. more detailed metadata for photos)
• integrating easy access to photo sharing and storing services in photo-taking devices (e.g. cameras with wifi)
• interplay between digital and physical forms of content (e.g. from digital photos to physical photo albums and vice versa).

Related to this, we also have the opportunity to create Cloud services that return relevant, enriched information back to the user. By storing data from users’ lives and returning it back with relevant, additional data, the Cloud services can provide meaningful communication between a user and a Cloud service. For example, combining and comparing the data from one individual user and the large mass from the whole user population of the service often informs and entertains the user. The data, the content, metadata and its meaning can increase and enrich our future in several ways if service developers’ innovativeness and end-users’ needs meet.

No service is an island

We live in a complex and interconnected world where our lives are dependent on technology and other peoples’ specialised skills and knowledge. In order to create a successful new Cloud service for this setting, it is important to understand the whole and extend the focus from individual services to broader entities of services and user activities they support.

People get accustomed to certain types of service and ways of using them through their history of using a large set of different services. A new service is always related to existing ones, at least in the user’s mind, when they try to figure out what is the value of a particular service. The style and interactions are typically based on a set of familiar conventions. People are also making innovative connections between different services. In one of our studies we found a user updating a blog through a file in Dropbox instead of logging in to the blog service, and another user having keyboard macros stored in the Cloud and using them on different platforms.

Some users we interviewed described really complex combinations they have mixed from different Cloud services. People also need “meta services” that help them manage their collections of services. For example, a user can have several slightly different Cloud storage services, such as Dropbox, Google Drive, iCloud etc. An integrated view over these different services can help the user to locate content from all the services at the same time (for example, www.joliCloud.com). Services that help keep a record of different user and password combinations and support single sign-on are a specific kind of meta services that help users manage their service collections.

As we pointed out earlier in this book, sharing is an important practice for people. Cloud services – with their ability to have digital content available anytime, anywhere and for anyone – provide a
useful solution for this behaviour. At least in principle. In reality, the idea of anytime, anywhere and especially anyone rarely truly comes through. Why is this? Of course the technology itself still has some limitations, but more often the restriction is due to the companies who are fighting for the ownership of people’s content. This phenomenon is resulting in a situation where digital content exists in silos that do not communicate with each other. Our studies show that people repeatedly face challenging situations due to the fragmented nature of the Cloud services. In one of our studies, we received massive numbers of stories describing how people wanting to share photos of family gatherings needed to use several different Cloud storage services, email and paper mail to get the job done.

Imagine a situation where you take lots of pictures in a socially meaningful context, like a party with your friends. Usually these situations end up with a discussion about whether the person or persons with cameras could share the photos with all the people who were present. Instead of agreeing to this kind of potentially complex procedure of interactions, sharing should be simple, easy and service independent.

Many Cloud services already solve these types of problems in different ways, such as offering several sharing methods that can be used in service-independent ways or by combining different Cloud service storages. But there are still many users who don’t understand the availability of these services. One reason for this can be that in people’s minds sharing between various Cloud services is not obvious – they have not had successful experiences of doing this. It also seems that the previously learned behaviour dating back to device-based storing is still slowing down people’s capability to fully benefit from the Cloud and its opportunities. With time this will change, but the service developers and marketers need to educate users on the new capabilities of combining services.
A tale of how users combine and redefine the services

When studying how people save and share their files in Cloud storage services, we found surprising diversity in how users combine different services. Also the number of used storage services varied a lot, but the majority of people were using more than just one storage service.

Typically some of the new services were used because they were integrated to a new device that the user had bought. To expand from being only a gateway for moving files from this particular device to the Cloud, the service needs to offer some additional benefits to the user, e.g. connectivity to several platforms (devices using different operating systems), a superior user interface or several friends using the same service, making sharing with them simpler.

Some users were motivated to use complex combinations of services because of earlier catastrophes with their data security, i.e. hard drive breakages or corrupting critical data while synchronising it with data from another system. A premium example of such critical data is the personal contact book, which for some people may contain thousands of contacts. The most elaborate system that one user had set up for himself included a combination of three commercial Cloud storage services, his server at home and a fourth Cloud storage service run by a non-profit association. He had automated a system to copy his data in different places at different frequencies depending on the confidentiality, encryption and importance. Another user had four different Cloud storage services in use and a fifth in trial, each service having a quite specific role.

In summary, services are used and evaluated in the context of larger service entities. To really understand your users’ willingness to use your Cloud service, you need to expose yourself to the complexity of combining these services in people’s daily routines.
Part 2: How to create Cloud services with superior user experience

As we argued in Part 1, the development of Cloud services and associated technologies needs to be based on solid understanding of users’ needs and practices. In this second part we present several viewpoints to how successful Cloud services can be created in ways which offer a superior user experience with the new services. We start by discussing the evolving user practices and how they can be communicated by meaningful stories. Cloud services may have unique opportunities to enable Wow! type of experiences, keeping the users engaged. Further important enablers are multi-device service access and arising features of ubiquitous technology.

This part then turns into the methods and organizational issues which enable — and in some cases distract — the successful development of Cloud services. We present the special opportunities of UX methods and lean processes to support the Cloud UX development. Finally, the part concludes with two examples of making UX to an organizationally integrated aspect of a developer company.
Design for evolving user practices in the Cloud

Understanding how the Cloud works can be difficult for most people. It is therefore also hard for people to understand how the services, built on top of the Cloud, actually work. For Cloud service providers it is important not to assume that people know everything about your service when they start to use it.

In our study related to how people actually use a Cloud service we found that the “taking into use” process has an evolving nature. People want to take Cloud services into use gradually while they gain more trust in the service. We have simplified this evolutionary process into four steps, with the example of a content-storing and sharing service:

1. When people initially start to use a new Cloud-based content-storing and sharing service, they are testing it with some (in many cases trivial) content to see how (and whether) it actually works.

2. When people have learned how the service works and they get more familiar with using it, they start to upload more important content to the service. At the same time their trust in the service begins to grow.

3. After building trust in the service, people can start using the service fully in their daily lives. At this point they are ready to take more features into use (e.g. automatic folders and backups).

4. When the service has become an integral part of people’s everyday lives, they will innovate new ways for using and applying the service in their life context.

A company can support each of these steps by their own actions. First of all you should enable easy ways of testing and trying out the service. In other words, do not force the user to do things for which they are not yet ready, but allow experimenting with the service.

Secondly, an easy way of broadening the usage of the service should be enabled so that when a user feels comfortable in broadening the way they are using the service it is easy to do so. Thirdly, a facilitated “learning-by-using” is needed. Hence, introduce new features to users so that they fit neatly into the natural learning process. The fourth action involves designing flexibility into the service so that it allows everyday life innovations by people. Therefore, instead of trying to think of all the possible use scenarios beforehand and making ready-made solutions and features for them (in other words increasing clutter in the service) try to make simple features that allow for change and evolution in the way people are using them. A further idea could be to enable people to share their everyday life “use” innovations with other users through your service.
be to include the opportunity for a person to share such innovations with other users through the service.

A growing challenge to companies is figuring out how to enable these everyday innovations for end-users and be able to maintain their interest in the service with this opportunity. The ideal situation is when users are really able to adapt the service to their own everyday needs. A central question is how properly to define the scope of the service – in other words, how to find the balance between the exact customers' needs related to a specific use situation and the more generalised need of people to adapt their practices through everyday usage. In order to find answers to this, companies need to continuously do research and learn about their customers.

People using Cloud services are becoming more and more demanding. Continuous user studies can help to keep track and be ahead of customer expectations. See Figure 3 for an example.

**Figure 3:** Too much automation can lead to confusion and frustration from end-users' part

-F-Secure has strong competence in the area of antivirus solutions. The nature of these solutions is that they are quite invisible in their users' everyday lives, as they do their protection duties in the background with as little interference to the person's life as possible. However, when moving to more active personal Cloud type of services, this type of mindset in the design of the solutions has to be changed. This was made obvious by our study in which 60 people used F-Secure's Online Backup solution during a six-week period. The users reported their experiences in using the service either online via the Owela co-design platform or in the face-to-face focus groups arranged during the study.

F-Secure had designed a nice "take-into-use" wizard that, with only a few clicks, enables the person to start downloading almost all the content from their computer to a Cloud-based storage solution. However, through research we found out this was not what the users actually wished for. They wanted first to try out the service with only a small amount of content. The "taking-into-use" process was actually too automated in such a way that people did not understand what they were actually asking the service to do. For example, when they specified in the wizard that they wanted to store photos, they did not understand that the service would find every file stored in picture format on their computer and start to upload all those to the Cloud. This failure to understand what had happened understandably led to false expectations and misunderstandings, which in turn led to frustration – especially about backup and restore time.
Often useful insights can be found by studying how people, in the eyes of the company, use the service in a “wrong way”. This means that you need to be ready to challenge the original service concept idea and revise the logic and value proposition of your service according to the experience data collected about the service usage.

Today, more and more data is being collected through the services themselves. In this case, you have to remember, however, that you are then collecting data on how people are using your service now, not data on why they are using it the way there are or how they would like to use it. In order to gain this insight, companies need to understand how their service fits into the larger context of the person and their daily life. The role of a specific service can be quite insignificant when viewed from this larger perspective. In other words, the service provider should be able to change their solution-centric perspective to a more human-centric perspective. Companies who own this type of “big experience data” and know how to use it with insights into true customer needs are in a better position to create successful services.

Further reading
Stories are windows to people’s everyday needs and experiences

Stories are everywhere in our lives and for a company interested in understanding their customers better, stories provide a rich source of information. A story or narrative is usually told in a specific situation to a specific audience (Riessman, 1993). They have a beginning, middle and end that are tied together with a plot that flows through the story. As stories include a time aspect, they are able to reflect the past, present, and future experiences. Hence, by analysing stories people tell to us and each other, we are able to see how they make sense of events and actions in their lives and how experiences come to be.

Stories can be collected in many ways: you can interview people face to face or collect stories through the internet. It is also good to remember that you don’t always have to start from scratch. There is a wide collection of stories already existing and being stored in a variety of places such as letters, books and social media services. The key thing in the analysis is to go beyond what is said in the actual story and figure out why the person is doing the things they are describing. Hence, the key is to understand the underlying job that the person is trying to get done. Event-based narrative inquiry technique (EBNIT) (Helkkula and Pihlström, 2010) is one of the more specific techniques you can use.

Further reading


Kiljander, H., Nore, V. Experiences with Online Focus Groups, Magic Wand, and Long-Term User Testing in Strategic Product Design, Industrial Track, Proceedings of NordiCHI 2012, ACM.


A company can integrate stories as part of the decision-making process related to e.g. new services release design or company strategy at a more general level. At F-Secure this challenge is solved by taking the underlying customer needs identified from the stories as the basis for thinking new service releases. The process started with an analysis of how well the predefined service scope matched the issues found from the stories people told. The UX team created a list of user needs based on the stories, which were then used as a basis for discussion where all the relevant stakeholders were present and defining the upcoming releases in more detail.

In order to make business decisions with the help of stories collected from customers, other information is also needed. In the F-Secure case, those other issues were benchmark data on competitors’ offerings and an understanding of different delivery channels. All this information was then included on one “canvas”, which was used as the basis for discussion. This prefilled canvas was then used for ensuring that all the important decision factors were equally considered when making decisions of release scope. In practice, one release scope was defined in only a couple of hours by using this method of working. The canvas and its information were used in prioritising service features by looking at their relevance to users, uniqueness in terms of competition and suitability for different delivery channels.

By innovating new ways of working, stories can be included as part of the release planning of new Cloud services.
Wow your users, but provide long-term benefits

When new services are offered to consumers, they should immediately have a feeling that the service offers something special, something fascinating, something joyful – they should say “Wow – this is what I want!” Where the same user need can be fulfilled with a multitude of alternative Cloud services, the immediate fascination of the service in the user’s eyes is crucial.

What is wow?

Wow refers to outstanding user experience containing components of “pleasant surprise, fascination and desire” (Desmet, 2005). It could also be defined as the commercial little brother of “peak experience”, which has been studied since the 1950s. Peak experiences may be experienced only a few times in a lifetime. They may be mystic, even religious and may alter the way people see their existence. Peak experiences have been described (Maslow, 1959 and 1964) with attributes like:

- goodness (desirability; justice)
- beauty
- wholeness
- aliveness
- uniqueness
- perfection
- completion
- order (symmetry; structure),
- simplicity
- richness
- effortlessness
- playfulfulness (fun; joy; humour)
- self-sufficiency (autonomy; independence).
Another important wow-related concept is the flow experience (see Csikszentmihalyi, 1990) for a thorough explanation). Flow can be defined as the “result of voluntary action that is goal-oriented, occupies full attention and is at the optimum (high) level of one’s capabilities”. Flow is always active and conscious but helps a person to momentarily loose self-consciousness and forget about personal worries. There are eight factors that are either enablers or results of flow experience (Csikszentmihalyi, 1990):

- a task that is possible to finish
- a chance to concentrate
- clear goals
- immediate feedback
- deep, effortless concentration that leads to forgetting one’s worries
- the feeling that actions are in one’s own control
- worry of the self disappears, yet after the experience the consciousness of the self returns stronger
- altered perception of time.

Wow reactions can be triggered also when a person is passively following some event; but when a person’s role is more active, a flow-kind of experience is very often present. Therefore we encourage you to engage your user in a way that is in accordance with the flow enablers listed above.

This is sometimes contrary to what you may have learned from usability or from flow experience, where the actions often become optimised to gain maximum efficiency.

**Wow design**

The wow effect is especially crucial in consumer services where users willingly adopt (or discard) the service, but the positive effect of exceeding user’s expectations can be a significant factor also in acceptance of the work-related services.

Based on a study of how wow is perceived in Cloud services (Väänänen-Vainio-Mattila et al., 2011), the following wow design implications have been identified.

**General wow design implications**

*Design for unmet user needs.* When designing products and services in a human-centred way, uncover user needs that are not yet met, then offer novel solutions to them. This kind of differentiation can also help form the business case for your service.

*Superior usability and aesthetics.* Smooth usability is an essential basis for a wow experience. However, to achieve a wow experience the product must go beyond neutral user experience. Some out-of-the-ordinary user-interface effects are needed, for example beautiful visual designs.

*Design towards specific types of wow experiences.* A service can be designed with a specific experience in mind, to give the service a memorable character. Examples of such target experiences are fantasy, playfulness, exclusivity or retro. Such characteristics can be used as a basis for a design vision that is shared among the service development team to unify the development efforts.

*Moderate wow effects for “serious” application domains.* In services that are meant for serious domains – for example information security – emphasising the wow might cause discomfort or mistrust. In these domains it is better to aim at superior usability with more traditional effects.
Cloud-specific wow design implications

Provide positive surprises by offering dynamic service features through the Cloud. New functionalities or user interface elements in the Cloud service can keep users stimulated in long-term use. They will feel that they gain more value by using your service. In the long run, this may increase the engagement of the user with the service. Design the pathway of the experience so that the user will probably go through several positive experiences in some meaningful order.

Support automated data integration of and universal access to user’s personal data. Automatic updates through the Cloud will support task flow and create a feeling of being always up to date. This data integration can also work between services in a way that allows mash-ups of the user’s personal data, e.g. communication feeds from different email services.

Design for personalised multi-device and multi-channel service access. Cloud services may be accessed via multiple devices, and through different channels. Various channels should support each other, and the user experience via different devices should have some coherent elements, improving the brand experience of the Cloud service.

Support security and trust. In the Cloud, users give up full control of their data and services, because they are not stored locally. Even though security is a necessary "hygiene factor" of usable services, supporting users’ trust in the long run can support wow experiences.

Wow as a design target can contribute to long-term positive feelings towards a Cloud service. Experiencing wow can make the user feel joy and success. Furthermore, users may have a positive image about the product even after long periods of time – improving the brand value of the service company. A challenge in designing for wow is that it is so subjective that probably no single feature can wow everyone. A variety of ways to evoke wow is needed; however this may also be a risk since unsuitable attempts to wow can become serious "non-wow". There are probably also considerable cultural differences in what kind of wow effects function for different cultures or target populations.

Further reading


Multi-device access should support seamless service UX

The Cloud offers the opportunity to improve user experience by making information and services accessible anywhere and with any device. The devices may be based on different computing platforms, either mobile or stationary. Each platform has its unique characteristics and user interface conventions, and these conventions may differ in style. For example, mobile devices offer more restricted screen space, but on the other hand may provide new interaction opportunities, for example through location awareness.

Frequent (almost real-time) synchronisation of the data to the Cloud will further support positive user experience.

Accessing Cloud services with different devices can take two approaches (Wäljas et al. 2010, see Figure 5):

1. The service is accessed with different devices (multi-channeled services). For example, train timetable viewing and ticket booking can be made via a PC, tablet or smartphone.
2. Different devices are used to access different parts of the service functionality (cross-medial services). For example, in a sports tracking service a smartphone is used to track sports session data and the PC is used to view the long-term training history.

When designing for multi-device service interaction in the context of the multi-channeled services, the main question to be addressed is whether the full functionality should be accessible on all devices or if some devices offer only a subset of functionality.

In cross-medial services, the main question is how should the user interface on different devices be designed so that the Cloud service users can seamlessly continue their interaction tasks while moving between devices (platforms). Appropriate support for task migration is needed, when carrying out an activity and switching devices “on the run”. Situations in which a user begins one task on a device and continues the same task on another device need to be supported also between different platforms.

Consistency across different platforms and within a single platform

In all multi-device designs the user interfaces need to have some level of consistency across different devices. The challenges regarding consistency lie in the heterogeneity and constraints of different platforms and their user interface conventions. This is a major design challenge due to the complex and diverse nature of different platforms and devices through which the Cloud services can be accessed.

In our studies regarding media storage services in the Cloud, people were contempt with designs where the consistency came from using the same or similar icons and colours in different platforms. Users had a clear preference about sticking to the interaction conventions (gestures, action sequences, logic of using menus etc.) typical for each platform.

Figure 6 shows an example of F-Secure’s Content anywhere concept where different devices utilised the interaction conventions of each device platform. Visual consistency of different user interfaces is provided by similar colours and icons.

It is profitable to design multi-device services in a consistent manner to enable a short learning curve and to help users to identify a certain service with a certain brand.
Cross-platform services that are accessed from multiple end-user devices form an essential enabler of current and future Cloud user experience. We must pay special attention when designing such services. Specifically, we should design consistent and coherent user interfaces for the different devices in multi-channeled services. This helps the user to gain the feeling of a unified service experience. In addition, when designing for cross-medial services, it is essential to support the continuity of the task flow, which provides efficient and seamless user–service interaction.

Further reading

Ubiquitous technologies enable new forms of social interaction in the mobile Cloud

The Cloud enables service sharing and social interactions between mobile devices and their users. New forms of interactivity and connectedness are starting to take shape in the mobile context. Ubiquitous, sensor-based techniques can be used to create novel forms of interaction, for example based on users’ location, device position and social context. A wide range of personal information can be utilised to understand the social context and to find potential issues that could be used to create new, positive interactions between people (in proximity). Such data includes calendar and contact information with connections between people in social media and data from various applications the users are using, e.g. games, music and sports applications.

Social devices are an example of a concept that utilises such novel forms of interaction. Social devices are proactive, context-aware mobile devices that aim at increasing and improving the social interactions between people who are located in the same space. Social devices recognise other devices and people in their proximity, and initiate interaction among the devices and people (see Figure 7, see page 53, Väänänen-Vainio-Mattila et al., 2012).

Three usage scenarios for social devices are described below (Väänänen-Vainio-Mattila et al., 2013).

Friend request in a parking lot: Two acquaintances meet in a parking lot of a grocery store and the devices suggest friendship in social media.

• Social context: A public place outdoors with many strangers around.
• Examples of potential interactions in the scenario: One of the device talks to the other by suggesting friendship. The other user “nods” with the device as a sign for accepting the friend request.

**Searching for friends in a restaurant:** The phone is used to search for one’s friends in a familiar restaurant.
• Social context: A semi-public place with some strangers and potentially some familiar people.
• Examples of potential interactions in the scenario: The user spatially scans the area with the device to find friends. Once a friend is found, the device speaks up the name of the person. The user can gesture a “come here” gesture to the friend, whose device speaks out the invitation to join the person.

**Betting at a friend’s house:** Making bets with friends about a game on television at a friend’s house.
• Social context: A familiar environment with only familiar people around.
• Examples of potential interactions in the scenario: Devices give suggestions for betting. Users swing up or down their devices to raise or lower the bets, turning screen down to exit the bet.

To support various forms of interaction, different modalities are used in social devices: speech output is used to initiate interactions, and spatial gestures are used to control the interactions, for example to invite other people to join face-to-face discussions or to look for people with similar profiles.

Potential positive user experiences that can arise from using the social devices:
- **Connectedness** – Increasing connectedness between familiar and unfamiliar people is a basic human need and can produce profound experiences for the users.

Ubiquitous, sensor-based technologies can be used to increase connections between people who are in the same place.

![Diagram of social devices supporting interactions](image)

**Figure 7.** Social devices support co-located interactions between people through the mobile Cloud (Väänänen-Vainio-Mattila et al., 2012)

- **Delight** – When people find new, like-minded people and location-based services, they may experience moments of delight, even wow!
- **Surprise** – When social devices initiate interactions, they may cause positive surprises.
- **Curiosity** – People are in general curious about their surroundings, and social devices can help fulfill this need.
- **Awareness** – Knowing what is going on in one’s vicinity increases user’s control of the situation and may lead to new connections between people.
- **Competition** – In some usage situations social devices can support playful competition between people, which can lead to positive experiences.
Some of the threats of this kind of mobile Cloud interaction should also be noted: If the devices speak aloud when other people are nearby, the users may experience loss of control and, in the worst cases, their privacy is threatened (if, for example, their name or other identity details are revealed). There may also be moments of embarrassment if the user is required to gesture with the device in public spaces.

However, we see the social device interactions as a voluntary, playful activity that can increase human connectedness and offer inspirational, delightful moments – even wow ones.

Further reading


Väänänen-Vainio-Mattila, K., Olsson, T., Laaksonen, J. An Exploratory Study of User-Generated Spatial Gestures with Social Devices. Proceedings of Mobile and Ubiquitous Multimedia, MUM’12, Ulm, Germany, December 4-6th, 2012, ACM.

The Cloud provides new opportunities for UX methods

Research into user experience of the Cloud does not need any fundamental change of user research methods. However, there are some opportunities that stem from the specific characteristics of the Cloud itself.

Existing, well-known user research methods with a twist of new thinking inspired by the Cloud context and product challenges are a very effective way to get excellent results. Figure 8 shows how user-centred and service design methods can be used to help service creation. The example is from F-Secure’s user research toolbox. The methods are described briefly at the end of this chapter.

Figure 8: Example toolbox used by F-Secure (brief explanations of the methods are given at the end of this chapter).
This kind of toolbox has been used to create Cloud services. A successful end result can be achieved using just some of the methods shown in the figure. Appropriate methods for a particular project should be innovatively selected and adapted. In many cases, this will depend on the environment and the project's schedule. In any case, users should be involved in all phases. Many of these research methods are very familiar from user-centred design and service design work.

New opportunities from Cloud UX research

There are some special differences in how research related to UX design and evaluation can and should be done in Cloud service development. These relate to: (1) the inherently social characteristics of the Cloud, (2) the online nature of the Cloud, (3) the various device platforms used to access Cloud services, (4) the dynamic nature of service development and (5) the ecosystemic nature of Cloud services.

1. Design the social user experience for communities

The Cloud is an inherently social place where many services support online interactions between users. Sociability is a very strong motivator for consumers to start using a Cloud service and for making frequent visits. Various characteristics of social media can be used to make a Cloud service alluring to different types of user communities. Being connected with other people can be a design driver for many types of media and communication services.

2. Utilise online and large-scale evaluation in the Cloud

Through the Cloud, a large user population can be easily reached when evaluating a new service or service feature. This allows for large-scale testing in various phases of service development. Compared to a non-online situation, this can be a huge advantage in both cost and coverage of different user groups – especially in the global service market. Certain methods are especially suitable, for example AB-testing and online community tools such as Owela (presented earlier in this book). However, such methods do not fully replace the need for face-to-face user research, which gives a more in-depth elicitation of user feedback.

3. Support superior UX on multiple device platforms

One of the specific UX opportunities of Cloud services is that they are accessed through different types of terminal devices: smart phones, pads, laptops, PCs and public terminals. Users need to have the same type of service experience but at the same time benefit from the special characteristics of each platform. Especially important is to allow tasks to flow from one device to another, as a user switches device in the middle of using a service. The coherence and flow in the user experience needs to be designed and evaluated in any Cloud service development project.

4. Iterate UX with dynamic service development

Many Cloud services are “always in progress”; that is, they are constantly evolving as developers add new features and change old ones according to user feedback or a developer’s own ideas. This is both a great opportunity but also a risk. The opportunity lies in offering the customer (the user) novel features throughout the service life cycle. The risk is in making continual changes, which may reduce learnability and in some cases deteriorate user experience because of the complexity or non-optimal usability. The evolution of a service needs to be planned and communicated to the end users in an explicit manner.

5. Consider service entities or ecosystems in UX design and evaluation

Cloud services form an ecosystem – “no service is an island”. People use different services in combination. A new service will need to fit into the existing needs and routines of the end users. Service developers need to be aware of the current service context when a new service is being offered. From the end users’ viewpoint, a new
service should complement the purpose and functionality of exist-
ing services.

As in all UX research, remember to:
• Start by planning the user research process as a part of your service development.
• Focus on the early phases of the development process.
• Conduct user research in many ways and combine methods (quantitative, qualitative, market analysis, etc.).
• Use suitable methods for research in all the main phases of product creation (vision, product creation and market feed-
back).
• Be always open to suitable new ways for carrying out research. Your toolbox needs to be constantly under development and changing.

For examples of how methods can be used, see the chapters on case studies for a goods spotter and the liquid user experience at the end of the book.

Toolbox: Examples of UX research methods in F-Secure

The following are short descriptions of the methods in F-Secure’s toolbox and what they mean in practice (see Figure 8 above).

Trend Research
This is desk research that focuses on how the evolving digital trends of Internet usage relate to the five themes predefined by the company.

Quantitative Market Research
This market research is usually in the form of web interviews (CAWI), normally with a total of about 6,400 interviews in 14 different countries and market areas.

Personas
Company personas are created using this type of process:
1. Survey customer values in different market areas.
   This identifies the importance of 60 individual human values in the context of online interaction.

2. From values to persona dimensions
   A principal component analysis is used to combine individual values. Dimensions are named based on the values included in them. Together the persona dimensions make up a persona.

3. From persona dimensions to persona patterns
   Find the patterns of persona dimension preferences of individual respondents.
4. From persona patterns to persona one-pagers

This is a data-driven approach for writing the one-page persona descriptions. The survey results are used as the basis of the descriptions. Information about persona patterns + demographics + context questions = persona description.

These personas are used in several ways inside the company, for example:

• Persona-driven competitive analysis
• Brainstorming with personas
• Persona-weighted feature matrix for prioritising solution features
• Creating scenarios for products based on personas
• Creating a design based on personas
• Validating a design using information about the personas
• Creating marketing messages for selected markets
• Validating the business potential of different markets

Focus Groups
Focus groups are discussion forums with usually 6-10 product end users. The discussion themes are pre-planned and moderated and observed by a UX specialist.

UX Benchmark and Heuristic Evaluation

**Benchmark**
- Expert review (3-5 experts)
- Individual and combined review by experts
- Based on the top user goals
- Heuristics are used to avoid purely subjective opinions

**Heuristic evaluation**
- Based on tasks (to get qualitative data)
- When a heuristic is violated, it is given a point (1–3)

Usability Testing

Usability tests are conducted by real users with the software in a test lab. They can be done for any UI prototype that is complete enough for users to follow the main task flow. Real, representative end users are used to validate a design. One usability test contains 6-12 test sessions and one test session takes a maximum of two hours. Results are written in a test report that describes problems and improvement recommendations.

Long-term UX Testing

Long-term UX testing combines several methods together. The testing can be daily using an online environment like VTT’s Owela where daily discussions, chat sessions and mini polls about defined product aspects can be collected. These studies can last for example 4-8 weeks with a few dozen end users.

Value Analyses

Value analysis is a narrative technique where we concentrate on the different values in the three parts of a user’s journey:

- Desired value
- Expected Value
- Value-in-use

UX Review Board

This is an evaluation using heuristics by the key people in product development. This task-based UX evaluation uses real productised software. Scores and points taken during product creation are used to direct UX development.
Alpha & Beta Testing
Early versions of a product are tested by real end users. Their feedback is used in developing the product.

Net Promoter Score
An NPS score is a well-known method for measuring an end user’s willingness to recommend a piece of software to others.

A&B Testing
A&B testing is mostly used for comparing different solutions in a real end user’s life environment. Metrics and usage data are collected and used for making product decisions and developing the product and UX further.

UX work can be lean

UX work for Cloud software is in practice similar to UX work for any other software. It is often essential to focus on the UX of the services when developing Cloud solutions. Cloud software is typically limited in size and in the amount of features. It is used with various devices and with limited input methods such as touch screens. Thus, the importance of good user interaction and intuitive user flow is often essential in Cloud software.

By UX work we refer to work that focuses on creating user experience. Basically all Cloud software that someone uses leads to user experience whether or not UX was consciously created or not. Agile UX work emphasises the proper integration of UX activities in agile software development. This chapter describes the principles and best practices of agile UX work.

Inherently, UX work fulfills many agile and lean principles. The lean philosophy aims at maximising the ability to create customer value and to see the whole. Short feedback cycles and cooperative work in fact facilitates UX work. UX work is based on human-centred design principles where core principles are understanding the user needs and contexts of use, involving the user, and working iteratively. Table XX below introduces the basic principles of agile, lean and kanban development. Those principles that especially are emphasised also in UX work are emboldened in the table. You can learn more about agile development from e.g. Highsmith et al. (2001) and about lean development from e.g. Poppendieck et al. (2003).

“In desktop applications people can live with bad usability, but no one will use a poor mobile application. Especially on touch screen, it is very easy to fail with user experience. Even the top management understands we really need to design it well.”
Senior UX designer
(quotes in this chapter from Kuusinen, 2012)
Many people see UX work as a heavy process with a big design upfront phase. This is understandable as in many cases UX work has been conducted in waterfall processes and no well-suited agile methods for UX work have existed. When companies have adopted agile practices for software development, UX work has often been left aside as the current agile software development models neglect UX work. Developers have a clear role in agile methods such as Scrum and Extreme Programming, whereas UX specialists just had to adapt to agile ways of working often as outsiders. In many companies, this has led to improper integration of UX work and other software development activities. It usually leads to inefficient ways of working as the roles and responsibilities are unclear.

As UX work emphasises creation of the holistic picture of the service and guiding the development in the right direction, it needs to be started from early on. It is good to remember that all software used by people leads to user experience whether it was deliberately designed or not. Therefore UX activities need to be part of R&D practices; UX is a quality attribute and it cannot be added on – it must be built into the software during the development.

**Agile UX work must be cooperative**

As most of the UX specialists’ work is about studying, planning and designing, it should be conducted at an early stage of the development process. Some design upfront work is usually needed to clarify the most important functionality and the design on a high level. Some design decisions may have dependencies on architectural level decisions. UX specialists should be working with short feedback loops together with product architects and developers to define and agree on the decisions that are fixed early. Such communication includes e.g. selecting systems and development technologies that enable creating the aimed user interaction, designing interfaces between backend and frontend, and discussing how to create as good UX as possible in situations where technical limitations exist e.g. because of legacy issues or use of certain systems or dependencies.

**UX goals should be aligned with business goals.** UX specialists are often involved in the process already during customer negotiations. They can help to scope the planned functionality and make

---

<table>
<thead>
<tr>
<th>Agile Development</th>
<th>Lean Development</th>
<th>Kanban Development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individuals and interactions</td>
<td>Eliminate waste</td>
<td>Visualise</td>
</tr>
<tr>
<td>Working software</td>
<td>Amplify learning</td>
<td>Limit WIP</td>
</tr>
<tr>
<td>Customer collaboration</td>
<td>Decide as late as possible</td>
<td>Manage flow</td>
</tr>
<tr>
<td>Responding to change</td>
<td>Deliver as fast as possible</td>
<td>Make policies explicit</td>
</tr>
<tr>
<td></td>
<td>Empower the team</td>
<td>Implement feedback loops</td>
</tr>
<tr>
<td></td>
<td>Build integrity in</td>
<td>Improve collaboratively, evolve experimentally</td>
</tr>
<tr>
<td></td>
<td>See the whole</td>
<td></td>
</tr>
</tbody>
</table>

Table 1. Basic principles of agile, lean, and kanban development. The ones common with UX are emboldened.

Sources: Agile development (Beck et al. 2001), Lean development (Poppendieck et al., 2003), Kanban development (Anderson, 2010)
communication about the functionality easier by sketching the UI and user interaction. This work can save money; a UX designer can sketch quickly something that visualises the plan and enables easier understanding and communication of the requirements. Often quite high-fidelity sketches or even partly functional prototypes are used during customer or funding negotiations.

When development is ready to start, product backlog can be iterated in a way that developers start with features that have high technical and business value and low UX (or user) value. That gives time for the UX designer to do more detailed design for the next development sprint (sprint 1 in Figure 9). Figure 9 presents a widely recommended model for doing UX work as part of agile software development.

![Figure 9. One sprint ahead model. Redrawn from Sy (2007).](image)

The process model starts with some design upfront (sprint 0) where high-level UX, business and architectural decisions and designs are made. Sprint 0 usually takes days to weeks, sometimes even months. Proper strategic level planning, research and studies outside the project work enable a short sprint 0. Agile UX work also necessitates good facilitation, e.g. quite ready-made study templates and user pools where test users are quick to recruit. Another possibility is to acquire user studies from another company. Before starting development, a rough high level design of user flow is often available. It helps both to share the big picture or high-level goals of the developed system within the project team and stakeholders, and to give UX designers some idea of the overall functionality to ensure system consistency.

Development sprints start after sprint 0. Development work is started with high technical value – low UX value items. Design work is already started during sprint 0. During sprint 1, UX specialists make a detailed design for sprint 2 and conduct studies for sprints 3 and 4. This of course means that the project team needs to have some vision of the forthcoming iteration contents. Planning the forthcoming iterations should be made loosely enough not to weaken the ability to respond to change. One risk to keep in mind is to avoid falling into a situation where the project suddenly has fixed quarterly plans.

UX specialists and developers should have continuous communication. UX designers can ensure the implementability of the design by discussing it with developers before delivering it for development. The implementation should also be discussed. One of the best solutions we have seen is to have a pre-demo session between UX specialists and developers about one and half days before the actual demo to ensure the realisation of the design. This also enables developers to fix any issues during the current sprint.
Early UX work is essential – especially with limited UX resources

Sometimes a project does not have sufficient UX competence and they might not be able to consult a UX specialist. When the project success is even on a small scale dependent on user acceptance and satisfaction, this can be a critical situation. We have been following projects where they had already developed the first versions of systems with very poor UX.

No one intends to create poor user experience; it just happens if you do not pay attention and then you are in trouble. People tend to think that as we are busy now, we can improve the UX later. Usually, that later time never comes. It is quite straightforward to implement new features to a system. However, fixing something already implemented usually requires serious redesign, refactoring, and testing. In other words: rework – waste. Usually developers prefer working with new items over fixing old stuff. When the work content is not interesting, people tend to be less motivated. With poor motivation, one is producing less.

Some companies with scarce UX resources have introduced a method called “office hours” (Leszek et al., 2008). There a project can get a few hours of UX consultancy preferably in an early phase of the project. We were following one project that had already delivered the first version of a system. The team consisted of skilled developers without competence in UX. The first version had very poor UX. The project was delivering a tool for developers and, in many such cases, UX is overlooked. The driving idea was that developers can cope with any tool. However, even the developer–users did not want to use the tool. Using the tool was confusing and caused errors. The project team we followed started the next release cycle of the tool development with a half-day consultation session with a UX specialist. There they explained the tool and its problems to the UX specialist who then used another half day to redesign the user interface. After that, the project team had a two-hour meeting with the UX specialist who refined the design based on the feedback. The UX specialist was available for design questions during development cycles. After the release cycle, the software was evaluated by users in a rapid evaluation session. The design and implementation were improved based on the user feedback. Altogether, the UX specialist worked for two days for the project in four months of development time. The product owner was convinced they will never again have even an internal tool development project with no UX specialist’s contribution. The user experience of the tool was dramatically improved. In this case it means improved productivity of developers, saved development time, improved developer satisfaction and the possibility to sell the tool to customers as part of a larger system – additional sales.

See the whole

In agile UX development, the most common challenges are in creating and sharing the big picture, understanding and fulfilling user needs, in transforming from waterfall UX practices to agile UX practices, and in getting user feedback. Current agile development models emphasise technically working software that is created in short iterations. Losing the big picture of the project is a common problem in agile development in general. However, when there are UX specialists working for the project, understanding and cultivating the holistic concept idea is usually their responsibility. Thus it may seem an issue particularly related to UX work.

In many cases, UX work is not fully integrated with other software development activities but the UX specialists form their own unit and work for development projects from a distance. They may be working separately from architects and developers. In some cases,
such as with numerous large product families with requirements of high consistency, it can be a good way to work. In most cases having the UX specialists working with the rest of the project team in an integrated way may lead to lower overheads, to better communication, to better transparency and a more holistic shared vision of the project goals.

The most common approaches on realising UX work is to have:
1. Centralised UX teams from which a UX specialist’s time is allocated to project teams.
2. Distributed UX staff that usually work more closely with development.
3. A mixed centralised–distributed approach (especially in larger companies).

Both the centralised and distributed approaches have their pros and cons (Isomursu et al., 2012). With a centralised UX team, the organisation-level coherency between applications is easier to maintain. And with the distributed UX staff, the project level communication is usually more fluent and more consistent.

**Have a vision – lead your UX work**

Creative software development processes and projects benefit from a leader who has the vision and understanding of both creative design and software development. They also see the big picture very easily and induct the team with the idea. If the customer vision is fuzzy, the leader can also help to crystallise it. When starting something new, the leader can encourage innovation, involvement and commitment from the very first steps of the project.

The leader has an important role as an interpreter between all people involved (team members, customers, business owners etc.) and as an owner of the big picture. Every team member has an individual style of working – it is the leader’s job to encourage each team member to shine. The leader should ease up the team’s work as much as possible and take care of regular customer communication. The target should be to keep the design and development iterations short and give customers access to the designs and working pieces of software to enable easy and efficient commenting and improvement. Open communication and accessibility have key roles. At its best lean development encourages team members (including the leader) to learn from one another and broadens the thinking beyond one’s own special area. Designers learn to speak development and developers learn to speak design, which is crucial in multi-disciplinary specialist teams. “Leadership and learning are indispensable to each other” as John F. Kennedy noted.
The UX journey may be a bumpy road

This section describes our UX journey with one platform as a service (PaaS) project in a large company. The journey started with the platform acquisition one and half years ago. The main challenge for the project was to turn the platform designed for a single customer into one suitable for many customers with differing needs. Moreover, since we are working in an emerging area, the emphasis on the user experience and service design has been seen to be critical for success. Figure 10 visualises the UX involvement in the different phases of the project.

![Figure 10. Involvement of UX people in the different phases of the project](image-url)
Phase 1: Working as a small team and closely with a single customer
Since the user interface was seen as one of the areas where improvements were urgently required, two external UX consultants were hired to work together with the product management and the development team in a “Visual Uplift” project. At this point, the project was divided between two sites: the product line was located at one site and the product development at another. In the beginning the UX consultants sat together with the product management and they started the service design by drafting interaction flows and wireframes. The drafts were used in bi-weekly customer demos to initiate discussion, clarify user requirements and collect feedback for the design. When actual design started, UX resources moved to the development site and worked together with the development team. The bi-weekly customer meetings continued with demos of the actual design. The direct customer feedback motivated the team and made the customer aware of the project status all the time.

The ways of working in this phase included:
• Two UX people worked as a team – service design and UI design (interaction flows, wireframes, Photoshop visuals, html demo pages)
• UX people worked closely together with product management and with development team (co-located first with product management, then with the team)
• Regular customer demos

Phase 2: End of “Visual Uplift” project with two customers
Contracts for external UX consultants ended before the “Visual Uplift” project was ready. However, the value of UX resources had been learned during the project and one of the consultants was hired internally to the project as a UX lead.

At this point the project had started to grow. Work was divided now between three sites and we had regular customer demos with two customers. However, it was found out that the requirements of the new customer were quite different, but it was too late for the “Visual Uplift” project to be able to include the requirements to the design.

Phase 3: Bumpy road with fast-growing project
After the “Visual Uplift” project the complexity increased when we got several new customers. As already seen, the needs of the customers differed quite a lot, since their customers were different from one another. Thus, it was seen that regular customer demos with one or two customers would not be sufficient. Instead, some workshops were held with customers where the UX lead presented his ideas with visuals on how the product should be developed.

At this point the project was divided between four sites; three product development sites and one site mainly for product management. The UX lead was located with one of the product development sites. This created challenges in communication. As the whole project constantly grew, the workload of the UX lead got unbearable and due to that the focus shifted more and more from service design to UI design. Moreover, most of the new people who came to the project did not have an understanding of UX work and its importance within the project.

The ways of working in this phase included:
• Irregular customer workshops
• Showing different concepts with visuals to initiate discussion and to find out customer needs
• The focus of UX work shifted more to UI design instead of service design (visuals of the features in next releases)
• Fast-growing project
• A lot of high priority functional requirements from multiple new customers
• Too vague an understanding of UX and its importance within the project.

**Phase 4: There is light at the end of the tunnel**

In April 2013 the UX lead resigned and the project was left again without any UX resource. However, the importance of UX was again acknowledged by the management. Therefore, after a few weeks it was agreed that the UX lead who had resigned would do some work as a consultant for a month and we hired a new UX lead. We worked to transfer the knowledge about where we are and why we are where we are and to define new ways of working with UX issues. We now aim at making UX work more visible in the project and having a slightly larger UX team combining the skills of UX engineers, product managers, system architects and developers.

**Lessons learned**

- A bigger UX team is needed for this size of project (in June 2013 the project had eight agile development teams)
- UX work is needed when
  - creating user stories together with product management (focus on service design)
  - developing user stories together with development teams (focus on UI design)
- Co-location of UX experts, product management and development teams would be preferable
- In addition to customer workshops, some end-user research would be needed and collected usage data should be utilised better
- Knowledge about UX work should be actively spread within the project (giving presentations, participating sprint demos and feature concept study reviews)
- Customer and end-user feedback should be shared regularly also with the development teams
- Weekly demo sessions for whole projects could be utilised
- Using personas to create understanding of users of the product.
Organisational culture will foster successful service development: Case Flowd

Flowd – “a social network for music lovers” – was Digia’s first Cloud service targeted to the consumer market. Flowd was created both for business purposes and for learning about the new and fresh business context. The main target groups of Flowd are music artists and their fans, but also club organisers and record labels. The business model of Flowd is to provide artists perfect tools for nourishing their fan relationships. This is expected to lead to increased sales of music and merchandise from which Flowd will receive an affiliate fee. The target was to create a service with the two most important differentiators compared to competing services: 1) a more appealing user experience, 2) communication tools for end-users.

The development of Flowd started at the beginning of 2010 and the service was launched in December 2010. We conducted a retrospective study of the development of Flowd in late 2012, when Flowd had been on market for more than one year. The focus of the study was on the company’s internal development process in creating the service with the intended customer value. The main aim was to study what were the success factors of the new service development (NSD) process, including the organisational aspects of the service development company.

The study consisted of seven semi-structured interviews of seven Flowd development team members. The interview results were complemented and validated by the interviewees in two workshops, where the development process was also described.

The study confirms the importance of understanding customers’ desired value during the service development phases. Customer involvement in NSD also emerged in this study. The success factors of NSD were discussed in the following.

Employee involvement and expertise were clearly visible in the case unit. The Flowd team showed very strong commitment and fruitful teamwork. The members are experts in their own fields and they trust each other.

The NSD process needs to have an appropriate level of formalisation. However, in turbulent environments it may be more beneficial to implement non-formalised approaches. This was the case also with the Flowd team. The used processes were mostly the same as in the previous projects of the organisation. However, they were tai

Success factors in NSD

1. Antecedents of NSD success
   - Market orientation
   - Technology
   - Knowledge management
   - Organisational culture
   - Strategic HRM
   - Transparency

2. NSD process success factors
   - Employee involvement
   - Management measures
   - Customer involvement
   - Market orientation
   - Synergy
   - Cross-functional collaboration
   - Employee expertise
   - Transparency
   - Flexible and adaptable development processes

3. Service success factors

Figure 11. The Flowd user interface for iPhone (see http://www.flowd.com/)
lored to be more flexible and suitable for the team, to support their agile way of working.

**Management measures** can promote the success of development projects in terms of support for innovation, risk-taking or innovation-friendly attitude. The Flowd case is an instance of management support in the case company; the project was started as a spearhead project. In the Flowd project, management support was evident as the team was allowed to work independently, freely and it was allowed to modify its working practices and processes.

**Customer involvement** is said to have a positive impact especially in idea generation and in the development process, although care must be taken also to support the radicalness of innovations. Customer perspective was constantly and strongly considered in the Flowd team during the whole development process.

**Market orientation** concerns understanding consumers’ desires and is especially important for the identification of market opportunities in idea evaluation and the test of developed concepts. In the Flowd case, market orientation seemed to be one of the most critical topics. The team said that preparing to launch – how to launch, where to launch, when to launch – was crucial for the success of the service.

**Technology knowledge** is a central enabler of developing and delivering new services. One of the strengths of the case company is its knowledge of many technologies and of different industries.

**Synergy of internal and external environments** determines the success of NSD. Good contacts from the music industry were very important to Flowd development as they helped the team to understand what consumers expected.

**Cross-functional involvement** is a success factor that has an impact during all development phases. The Flowd team used scrum (an agile method), which fosters the idea of a cross-functional team: developers, architect, user experience specialist, graphical designer, project manager, product manager, and marketing experts – all working together.

**Organisational culture** and especially the learning culture, was recognised as a very strong factor in this research. The personnel of the company are committed to their work and continuous learning. In the case company, the organisational culture was said to include innovativeness, flexibility, agility, willingness and the capability to develop.

The results of the Flowd study create a solid ground and favourable starting point for the development of future Cloud services. Positive user experiences are a key target in designing consumer Cloud services. Realising the potential of the Cloud in creating customer value requires people with different views, background and knowledge.

Flowd offers an easily accessible global forum both for artists and consumers to share and connect. The amount of followers is quite high for the most popular artists, which refers to active and lively community. Music, arts, sports, photography or any other globally common concept are great areas for Cloud service innovation utilising social networking. Flowd, as with any other social network service, will live and evolve along with its members.

**Further reading**

Part 3: Creating business from Cloud user experience

Successful Cloud is about successful business. In order to build viable business around the Cloud services, end-user acceptance must be guaranteed. From the service developer’s perspective, user experience – in this context customer experience – can be one of the key differentiating factors when competing in the market. In this book part, we discuss different aspects of creating business from Cloud user experience. We first present the technological and business views of the Cloud. We then address issues such as value-driven design, willingness to pay and using user experience in a company’s brand image. Overall, this part argues that user experience is a central factor not only for the end users but also for the businesses. The companies in the Cloud business can use the presented viewpoints as landmarks for their success.
Cloud is both a technology and a business model

The word “Cloud” can express two concepts in ICT – it can mean both technology and business. Maybe the more common meaning of the word is to describe technological solutions used in a company’s operations, often referred to as “Cloud computing”. There are many definitions that capture this meaning of the Cloud (Vaquero et al. 2009). Cloud computing can be understood as the provision of shared resources and systems that are scaled and configured on demand. Cloud computing covers such areas of technology as virtualisation, elasticity, scalability, ubiquitous access and service-oriented architecture. It builds on related technologies, such as grid computing, utility computing and autonomic computing. Although Cloud technology has its own specificity, it is not an entirely new technology.

However the second and fresh meaning for the word “Cloud” is as a business model. Google CEO, Eric Schmidt, captured Cloud innovation in describing the company’s strategy for providing services over the internet (Schmidt, 2006). He explained how current technology made it possible to create “a new business model that’s funding all of the software innovation to allow people to have platform choice, client choice, data architectures that are interesting and solutions that are new” (Schmidt, 2006). Cloud “brings together existing technologies to run business in a different way” (Zhang et al. 2010, p.8). The business model of the Cloud has a large potential because of analogous transformations that took place in the history of other industries. The electric power and telephony industries, for example, underwent a business model transformation. Once the restructuring of the independent providers was completed, these industries became what we today know as “utility industries”. The parallels between the history of utility industries and the current transformation of the ICT industry suggest that the effects of the Cloud phenomenon are dramatic and lasting.

The initial adoption and subsequent reliance on Cloud technologies becomes paramount for the competitiveness of ICT businesses. Cloud phenomenon shapes the industry, opens up vast market opportunities, creates unique challenges for organisational processes and demands the redefinition of business strategies.

Organisational strategy must account for the changes in at least three main business functions: financial models, internal processes and the relationship with customers. With regard to financial models, companies need to adjust to the new cost structures. The revenue flows alter as software becomes a service rather than an application sold for an isolated environment. Innovative pricing models become valuable for reaching vast markets.

In the area of organisational process, service-based software undergoes standardisation required to support reuse and scalability of services. The reuse of software elements is crucial for the deployment of services in different environments. On-demand scalability is integral to Cloud computing. In software development the process scalability of Cloud services eliminates the risk of in-house over- or under-capacity of computational power. This minimises the threat of overinvestment in hardware or loss of potential revenue in case of insufficiency of resources. Software engineers can avoid investing in large amounts of capital resources and implement innovative ideas by taking advantage of Cloud virtualisation.

The perceived value of the user experience becomes a key differentiation factor in customer relationships. Cloud resources assist new and innovative ideas for companies to find their way to market quickly. As a result, the barriers of competition in the software industry change. The growing challenge for ICT companies is to differentiate themselves from a growing number of rivals.

Innovativeness of the Cloud is mostly in the business model, not in the technology.
New pricing models – one of the key elements in reaching wide markets – become an industry standard and therefore reduce the range for price-based competition manoeuvres. Companies that successfully implement zero or close-to-zero prices still face the need to differentiate their services from other free offers on the market. Other companies may choose to focus primarily on differentiation at the outset.

To summarise, Cloud is a disruptive business phenomenon, which forces companies to adjust their ways of doing business. The dynamic nature of changes in the Cloud challenge the relevance of existing concepts and tools in the strategy field.

Further reading


Experience is a viable differentiation strategy

A company that acts to distinguish a product or service from competitors is engaged in a differentiation strategy. Differentiation is making the uniqueness of an offering recognisable by customers. The effectiveness of the differentiation strategy depends on whether the unique characteristics are important to the customer. The uniqueness has to be recognised by customers and differentiation is typically understood in terms of customer perception. Therefore customer desires and values need to be acknowledged in the company’s strategy.

Customer desires and values are best understood and displayed in an experience. What we desire and value is demonstrated in our relationships, choices, purchases etc. in our daily lives. Experience summarises it all and is personal and unique. Because of that it is distinguished from any other experience. To understand how a company may create such experiences is to attain an ultimate differentiation strategy. Thus, experience and differentiation are closely linked together in a business.

Business of experience

There are two generally held perspectives on user experience. The first one focuses on customers’ goals, needs, behaviours, and emotions when using a product. A company surveys various market segments and incorporates the feedback to improve its products. This is a traditional approach that perceives user experience as an incremental product improvement. The challenge with this view is that the activities for designing for experience are focused on the product level.
A company may choose to evaluate user experience by measuring how an offering fulfils customers’ needs and wants. This perspective gives the ground for setting new targets and measuring the magnitude of user experience. As a result a product is being gradually improved as more observations of the product usage are collected.

The companies that take this approach put a product at the centre of their design process and view user experience as an incremental improvement of the existing product. Figure 12 illustrates the conventional business view of product augmentation. At the core, the product appeals to a known need and the actual product is designed to satisfy it. Services are then added to the actual product to provide some level of differentiation. User experience is viewed as adding another augmentation layer for achieving more differentiation. Corporate management treats experience of the product in much the same way as it does the other layers.

The challenge with this approach is that current business processes may fall short of designing for fun, enjoyment or pleasure. The problem is compounded when trying to add other experience qualities such as hedonics – primarily pleasurable attributes such as playfulness and fun. Though such qualities are not inherent in a product, they are attributed to it during the experience of it.

Another perspective of user experience is when an organisation emphasises the competencies that enable design for experience in the first place. In other words, corporate management aims at certain kind of experience and designs an offering that supports it. This perspective creates a need for business change, which begins with the transformation of the company’s viewpoint and focuses on the development of capabilities. The challenge is to combine diverse resources and deliver personalised experiences in all business areas that a customer comes into contact with.

The experience business model differs from the traditional one. It is grounded in the principle of staging an experience. A companies’ production process brings together talents, resources, goods and services in a coherent whole that engages individual customers. Consumption becomes a co-creation of experience, in which both customers and a company are involved. The resulting takeaway product is a memorable event. This is a competition imperative. This means that corporate management should view all the company’s outputs, processes and resources as means for making a platform where customers can create their personal experiences in partner-
ship with the organisation. In the business of experience there is a great need for this new mindset. Re-evaluation of the business viewpoint and realignment of the capabilities and strategies are the prerequisites of offering user experience as a product.

The focus of design shifts from an attempt to make a hedonic product to staging an experience. The goal of market research also moves from surveying needs to also understanding the value of experiences. When values are contextualised they can be expressed as needs. Knowledge of values enables a company to shape the context around them and empower the customers to have their diverse needs met as they engage with a product on a personal level.

Contrary to the conventional product development view the step that follows value analysis is not actual product but experience design. Since needs are subjective and context dependent it is sensible to understand how the company will shape the experience. Experience becomes a central concern and the product is designed around it. The value of the product is attributed to it by the customer either during an experience or a series of experiences. It is an attribution process that makes the product highly valuable to the customer.

As a result of the changed business strategy an organisation makes not product, but experience central to its development process. Figure 13 summarises the paradigm shift of product augmentation. Experience becomes central to the design offering, with actual product and additional services supporting the experience design. The value is co-created by customers as they use a product in various situations. The support for such a perspective requires an organisation to develop a strategy for investing in corporate capabilities. These new capabilities support the transition to the next level of differentiation, which is an essential ingredient for gaining competitive advantage.

Characteristics of the experience market

A distinct characteristic of the user experience business is the opportunity for users to create their own experience. The product that a customer gets is what they create in partnership with the company. This is different from customisation or user-centered design,
which employs methods for producing a final product targeted at satisfying known consumer needs. An experience product is a result of co-creation and is targeted at satisfying customer values. Although values are known to be universal, they are understood, expressed and attended to differently depending on context. Thus understanding customer values, contextualising them and designing for experience all become a pivotal principle of success.

There are two fundamentals to acknowledge with respect to the experience market. First, an experience product or service is a distinct offering. It is wrong to imagine that a company can shift to the experience market by relabelling its current products and services. Second, the transition to the experience business demands new capabilities than that of a service or product developer. For many companies this means developing a step-by-step process for disseminating the experience business throughout all organisational levels. The primary goal of such a transformation is the development of capabilities and processes that enable an organisation to compete at a new level.

By definition, experience is personal and unique, meaning the ability to stage a unique and memorable event is fundamental for experience creation. This is flexibility of a different kind and it hinges on competence development, i.e. providing enough flexibility in organisational processes to enable consumption by an audience of just one. However, organisations are driven by the production of goods and services that are created for mass consumption. This tension is creating a paradigm shift; one in which organisations have to balance the need for mass production with the consumers’ desire for personalisation.

In co-creation process the product that a customer gets is what he or she creates in partnership with the company. This is different from customisation or user-centered design, which employs methods for producing a final product targeted at satisfying known consumer needs. An experience product is a result of co-creation and is targeted at satisfying customer values. Although values are known to be universal, they are understood, expressed and attended to differently depending on context. Thus understanding customer values, contextualising them and designing for experience all become a pivotal principle of success.

Creating and delivering experience offerings requires advanced understanding of individual customer behaviour as well as general patterns of preference. Cloud technology makes such comprehension possible. This means that companies that operate in a Cloud business are well positioned to take advantage of the experience business. Cloud business benefits from access to a wide range of consumers, on the one hand; and an ability to accrue a deep sense of customer desire at an individual level on the other – meaning that a company can utilise its resource base to deliver a unique experience for every customer. Tailoring experiences to the needs of one customer provides a competitive advantage that can be enabled by Cloud technology.

Although tourism, entertainment and other service businesses have been long exploring the idea of an experience offering, the Cloud phenomenon opens up the experience market for the producers of all kinds of goods and services. ‘Cloud’ companies can appeal to customer values on a personal level, with great accuracy. Corporate management can leverage new internet-based technologies to align internal system architecture with the life events of individual customers and thereby open up new prosperous business opportunities.

Further reading
Customers want you to support their values

Research in sociology and particularly in consumer studies show that individual behaviour often deviates from professed values. One example of discrepancies between professed values and subsequent behaviour are customers who agree with fair trade values or see the importance of supporting the local producer but who still buy groceries that are more affordable. Where values and actions are in disagreement, it seems to be the case that the values are insufficient grounds for the development of new offerings.

Managers are encouraged to be especially mindful of information concerning customers’ future needs. Kotler (2003) contributes to this discussion in the following manner.

“Many consumers do not know what they want in a product. Consumers did not know much about cellular phones when they were first introduced. Nokia and Ericsson fought to shape consumer perceptions of cellular phones. Consumers were in a learning mode and companies forged strategies to shape their wants” (p. 21).

Kotler points out that customers are an unreliable source concerning their future desires and needs. One of the reasons why customers can’t predict their future behaviour and desires is the lack of knowledge about the future in general and about possible technological advancements. BMW Mini, Chrysler minivan, Sony Walkman and even Boeing’s 747 are examples of products that became hugely popular despite the initial little or no interest gathered by the market research.

The uncertainty of future circumstances, change of internal states and motivations seem to explain why a person behaves differently from the values and beliefs expressed in anticipation of that future. It is now well known that customers are poor predictors of their future desires. Thus, companies seek other methods for developing products and services. The opponents of needs research argue for the necessity to lead rather than follow the customer and to create the desire for breakthrough innovations. Henry Ford is known for saying, “If I’d asked my customers what they wanted, they would have said faster horses.” Akio Morita, the co-founder and a CEO of Sony Corporation in 1971–1994 said:

“Our plan is to lead the public with new products rather than ask them what kinds of products they want. The public does not know what is possible, but we do. So, instead of doing a lot of market research, we refine our thinking on a product and its use and try to create a market for it by educating and communicating with the public.”
A successful business does not only follow the explicit customer desires but also creates them. The creation of new customer needs requires a subsequent management of customers to influence their desires and to drive the demand. Thus, the view that business needs to balance between customer and sales orientation requires mastery of persuasion. The persuasion to pay for a product or service happens through an extensive use of the company’s resources, the art of marketing, selling and advertising techniques.

In some cases it is appropriate for a company not to listen to the voice of customers but instead create and launch an innovation to the market and educate customers about their needs and desires. The information about unexpressed values can be gleaned from the expressed ones.

The observation that customer values poorly correlate with customer behaviour is not a threat or weakness but an opportunity. It is misleading to conclude that values are unreliable for new experience or service creation because behaviour may not always follow values. This conclusion is an interpretation of an observation. Thus it can be subject to revision and a different interpretation.

Generally, there is no reason to assume that customers are mistaken in their ability to judge their future desires and value-based behaviour. Studies show that when people contemplate their values before acting they are more likely to follow through with their values. This has been shown that the value-based behaviour results in the feelings of satisfaction. Therefore, the leading companies target customer values as the basis for experience.

The fact that there are techniques available for enhancing customer experience by supporting their values suggests that companies can lead their customers with products and services to the realisation of their values rather than create and influence their needs. With the knowledge and understanding about values, management has a starting point for creating experiences that are a natural extension of the existing desires, but that stretch beyond what is known already.

Absolute customer centricity as well as product and selling approaches, on the one hand, may be effective in the short-term strategy for individual companies. But in long term they will have damaging effects on strategy, markets and companies’ ability to compete. Products and services that are created in response to the strong focus on customer wants may lead an organisation into the trap of producing ‘me too’ strategies with very little or no differentiation from competition.

On the other hand, the concentration of efforts on authoritative solutions may result in a waste of valuable resources in customer persuasion. The success becomes a function of effective marketing and sales efforts with less emphasis on delivering genuine customer value. Such an approach is intuitively rejected by customers as constraining. Also, the lack of solid grounds for why one product should receive support over the other can be daunting for a decision-maker. Furthermore, the growing emphasis on individuality transforms the understanding of markets. Strictly speaking, “markets” lose meaning in light of personalisation.

Values can be expressed and are enduring and universal. They are summations of what is desirable and serve as guiding principles for personal behaviour. Values are motivational and they shape intentions and desires. Despite the nature of values, creating an experience to support them can be challenging. It seems to be easier to design products or services for the known customer needs at least in the short term. When it comes to looking into the future, the line between knowledge and imagination is very obscure.

“Segments” and “markets” are being replaced by individuality. Therefore it is not the markets that should be targeted or penetrated, but individuals, who should be understood, within their universe of internal and external influences.
Experience creation stems from imagination

An important part of experience creation stems from the imagination. Values ground the imagination and lead to the development of possible novel products and services. Brown (2006) shows how a producer of experience needs imagination and bravery to secure the demand for its offerings. Imagination is integral not only to novel service and product development, but also for understanding of what the world around us is like.

The realisation of customer values through experience is an approach which – when built into strategy – can differentiate a business.

Further reading


Consumers are willing to pay only for the critical Cloud services

Over the last few years people have become used to getting almost anything free from the internet, at least to some extent. Companies face a tough challenge when deciding to charge money for the usage of the Cloud services they offer. This challenge can be overcome by offering the users added value that is greater than the benefit received from the free services. Also finding the right target audience for the service is crucial: who would actually pay for what you are offering?
Did you know that the more critical the data being stored in the Cloud, the more people are willing to pay?

We studied the pricing issue within one of the Owela studies* related to content storing and sharing. It turned out that people’s opinions on pricing varied a lot depending on the person as well as on the features of the service in question. Some people tolerate well advertisements in the free services, while some pay willingly for the comfort of the ad-free services.

One trend was obvious: the more critical and important the data being stored in the Cloud was, the more people were ready to pay. Obviously, this goes not only with the data but is also true related to the Cloud service in question: the importance of the service for the person had a major effect on the willingness to pay. In other words, people are willing to pay for the services if set tasks or goals can be achieved by using them. People want to get their jobs done!

People also need to understand the actual value of the service and to be able to use all the features the service is offering. Cloud service providers should include necessary advice and help to ensure the good customer experience.

The main reason for not paying for any service in the Cloud was that good-enough free-of-charge services have become a “standard”. People are used to being able to use different services free on the internet, and saw no reason why that situation should change. Several people mentioned that there are many good-enough free services available at the moment. The advantages offered by the chargeable services were not great enough to compensate the costs. Additionally, the cost of the mere use of the internet seemed to justify free Cloud services for many.

In this situation it is really challenging to get the message through to potential customers of the added value received by paying for service usage. Everything is possible though when user needs and service offering meet successfully. However, innovative revenue channels and business models need to be investigated.

“Free-of-charge service is the best option. Why? Well, you would not like to pay for anything that is also available for free!”

*September-October 2010 Owela study about peoples’ experiences and perceptions of Cloud services (Finland, n=47, 4 weeks)
Expanded UX capabilities create opportunities for customer experience business

Software companies providing UX design services for other software companies have a great opportunity to expand their market by providing a wider range of services. Traditionally the core business of the UX design has been to enhance both the use and the anticipation of use of a product. An essential requirement for designing for UX is to pay attention to user emotions, perceptions, interaction and behaviour before and during the product or service usage.

The core tasks of UX work are related to the elegant design of graphics, ergonomics, navigation and flow. It seems that recently companies who order UX design from service companies want and are ready to use a wider range of UX services. We call this wider range of UX services customer experience, which also includes researching market opportunities and customer values to provide experiences that the rivals are yet to think about. Customer experience is not only pleasurable, easy and “pleasing to the eye” but it is also a differentiating factor in business.

It is a natural strategic growth for UX service companies to offer customer experience and market research. In fact, as software and hardware producers make UX design an integral part of the in-house process, the UX design business will find its market maturing and leaving less room for the existing players offering such services. In addition to open-source competition, UX designers will see the integration of companies into larger businesses.

Prepare the company for experience opportunities

Prahalad and Krishnan (2008) present business transformation as a five-step process (see Figure 14). The advantage of the process is an evolutionary approach to implement a change. Particularly, it encourages creating a series of experiments that build on current capabilities to develop new ones.

The first step is to develop the consistent point of view, which represents the company’s strategic direction. The second step is to recognise current capabilities. Specification of the new worldview and experiments that are aimed at developing required capabilities follow the first two steps. The process aims at taking the existing business onto a new level of competitive advantage.

Figure 14. Adaptation of Prahalad and Krishnan’s (2008) approach to business transformation
Experience service is a distinct economic offering, which a company intentionally provides for its customers. For experience service a company intentionally uses services as the stage, and goods as props, to engage individual customers in a way that creates a memorable event (Pine and Gilmore 1998).

Creating a customer experience offer is to create an offering that is truly different. The focus is on understanding how the products can provide value to the end-users. Table 2 highlights some elements in such offering.

A company’s experience service has most value when it combines not only easy-to-use feature, elegance and technical support, but also includes other complementary products and services that impact end-customers’ life.

<table>
<thead>
<tr>
<th>Traditional UX services</th>
<th>New types elements in customer experience offering</th>
</tr>
</thead>
<tbody>
<tr>
<td>Company</td>
<td>Focus on technology and customers’ interactions with it. A company provides solutions and software platforms</td>
</tr>
<tr>
<td>Other partners</td>
<td>Make components</td>
</tr>
<tr>
<td>Customers</td>
<td>Consume</td>
</tr>
<tr>
<td>Managing customer response</td>
<td>Customers have a feedback into the systems must be solid in terms of reliability, include easy-to-use features, good documentation, technical support and other complementary products</td>
</tr>
<tr>
<td>Measuring business Performance</td>
<td>How labour-intensive the software business is</td>
</tr>
<tr>
<td></td>
<td>Metrics are based on customer values</td>
</tr>
</tbody>
</table>

Table 2. Differences between UX services and customer experience: business perspective

Developing new skills and competencies

The diversification of business into customer experience requires specific skills and competences. It is a related diversification because it builds on the competences of multidisciplinary team management and creation of integrated solutions. They form a good starting position, but to go further it demands development and understanding of new business and development of the relevant competences.

The fourth element of the business transformation process (Prahalad and Krishnan 2008) addresses the essential task of developing new competences for the described specifications of the new worldview. A series of experiments or activities allows a company to learn new skills. The purpose of these steps is to decrease the risk of changes and build required capabilities incrementally. This is a continuous learning process, which leads to new capabilities through a series of manageable experiments.

Further reading


A case study of building an experience differentiation strategy

We conducted an interview study and a customer survey in a case company in 2012 about their UX service offering. The case company is a Finland-based multinational software company. Historically, the business focused on enterprise systems, mobile devices and web application design. The company also provided usability services, which it expanded into a customer experience business.

In 2010 the company’s management sought to move into the market of providing experience for its customers. Its decision was to commission the user experience (UX) division to take advantage of a growing market opportunity. Still, the customers failed to appreciate the value of the UX as the factor that would dramatically enhance their competitiveness. As a result, customers were not interested in new services on a large scale.

The misunderstanding between internal or external customers and UX professional is a common business issue. UX professionals argue that their work is vital to business competitiveness, whereas internal management or outside customers are reluctant to accept their view. Regardless of whether UX professional communicates with management (internal customers) or sells services to other companies, the challenge is the same: make the listeners recognise the power of UX for business.

Based on our interviews we found that customers of the case company would fail to perceive the value of the offered UX services and, consequently, would not order them. The company’s UX division puzzled over the fact that customers admitted that good experience is a major selling point; nevertheless they would avoid subcontracting experts for that work and, instead, used in-house software engineers. It appeared that software companies expected their engineers to be informed about UX know-how. In one sense, a person developing software would need to be aware and responsible to the external users of the system, and not merely to the codvelopers.

The case company was faced with a need to differentiate its services from the developers’ skills. Thus, it sought to become successful in communicating and selling its new offerings to customers. In order to accomplish that, the company needed a business concept that would engage customers with the new service offering. Based on the interviews and the survey, we conducted an analysis with the current strategic positions and competences of the company. An overview of the current organisational competences evidenced that resources were aligned in accordance with the user experience definition. It was observed that a new definition of customer experience offering required the development of different competences.

A SWOT analysis was used to structure the interview with the employees and to develop strategic positions, which were filtered through the company’s values to create strategic choices. A SWOT was used to elicit employees’ understanding of user experience from a business perspective. In addition, the interviews included the creation of a pictorial definition of user experience. That is, interviewees were asked to draw elements of user experience, relationships and conflicts among those elements. This part of the interview was an application of the rich picture technique of soft system methodology (Checkland, 1990). This technique is a tool for learning and defining ill-structured and complex problems. Together with other techniques, rich picture can be used for finding solutions to problems in business and information systems (Checkland and Holwell 2005). Individual pictures of the respondents were combined into one to develop an organisational definition of user experience. The interviews further aimed at scoping the business potential, understanding current skills and capabilities.
The case company has a long history of UX expertise but the challenge was to communicate with customers in such a way that they would recognise the value of the offering. The company perceives itself as an expert in designing UX for its own services. Moreover, customers agree that UX is an important selling point; however, they cannot articulate clear requirements for what kind of UX services would enhance their business.

A provider of coding, graphics design and usability testing, the company seemed to occupy a perfect position for a strategic move into taking advantage of UX opportunity in the market. That is, it could compete by providing UX services but its position is weakened by customers’ perception of the company as a software provider, not an experience designer. Thus, the company needs to overcome the perception barrier before it is able to communicate its new services. For user experience to become a competitive advantage, a company needs to invest in it and transform it into what we call here ‘customer experience capability.’

In summary, the case company sought to strengthen its position in the business of customer experience offering but it used the existing skills to venture into a new business area. In other words, the company believed that its current value proposition matched a new market opportunity. The UX division communicated its user experience in terms of customer experience offers. Management saw an opportunity for developing a strong experience business and desired to improve the organisational strategic positioning. The company recognised the need to enhance communications with customers but it was by taking advantage of emerging market opportunities. One of the goals of the strategy was the enhancement of communications with customers.

During the negotiations of the scope of consulting project it became clear that the company’s employees understood their goal differently. The management envisioned a business that focused on more than usability and software design. They wanted to provide experience for users in a broader sense, i.e. customer experience. Sales personnel and project management understood their role as a continuation of what they had been doing before, namely improving the visual design and usability of software solutions. It was important to not only develop a common vision of business but also understand how the company could utilise current capabilities for such a business extension.

Often the success in B2B business depends on B2C relationships. This is especially so for companies that provide user experience design as a service. The competitive position of such companies largely depends on understanding their customers’ customers. In negotiations for buyer’s contract, for example, the knowledge of the end-customers gives an edge over rivals because to know buyers’ customers is to know their business. Without such insight the company will struggle to offer services that make sense to the buyer because they fail to make sense to its customers.

The move to interaction with the end-customer and to develop its business accordingly supports Prahalad and Krishnan’s (2008) observation that B2B and B2C markets converge. One of the drivers of convergence is the changing nature of the competitive environment. Particularly the transition from the transactional relationship with buyers to a service relationship with customers and to designing customer experience puts certain requirements on the business (Ng et al., 2012; Prahalad and Krishnan, 2008; Pine and Gilmore, 1998). When F-Secure sold anti-virus solutions to operators it looked more like a B2B organisation. However, when the company is working with end-customers to improve their services, when it educates the end-customers, researches their needs and uses feedback to improve customer experience, it looks more like a B2C organisation. Although the company’s financial streams may reflect B2B operations, they are only one component of a diverse business model, which has a B2C structure.

In experience business B2B and B2C markets converge (Prahalad and Krishnan, 2008). It is crucial for businesses to recognise such
industry transformation and adjust their business accordingly. The company, which wanted to win business for its user experience division, had to do just that. Particularly, it had to learn specifics about the end-customers and adjust its communication strategy with B2B partners.

The current capabilities were financial administration, integrated business solutions, project management, software technology intelligence and documentation of processes. It appeared that reliance on these capabilities to expand into customer experience services did not and could not enable the case company to penetrate new market opportunities. One needs to understand what makes a company unique and competitive. For over 20 years the case company’s business had grown and competed on something more than skills of project managers, knowledge of software engineers or financial consultants. An exercise for understanding competitors’ core competences can help outline what is required in the new market area.

After a systematic look at the end-products, business units, core products and shared values the case company was able to identify its core competencies that underpin the business. Multidisciplinary teamwork and managing integration are two ways they can be identified. Before the management realised its company’s core competences it considered that the open-source community, for example, was a direct threat to their software business. With the fresh view of its business, however, management could begin to develop ways to circumvent or collaborate with that market force.

After an analysis with several iterations, the definition of the desired future read:

*The company aims at creating a system where it provides offerings to produce customer experience utilising its teams of experts through the multidisciplinary teamwork, which is constrained by shared value of software solution developer.*

When compared with the current strategic positions, this definition of a desired future makes it apparent that the company communicates with a different market, while using the same offering. The expansion of the same product to new markets is a type of a market penetration strategy. The lack of clarity in understanding current and future business positions was largely responsible for the confusion brought about by the company’s actions and the respective market response. As a result the management puzzled about the effectiveness of the UX division and the general competitiveness of its UX services.

In ICT industry the experience service can be seen as a foundational service that is designed around customers’ lives, not technology. In practice, a software company’s experience service has most value when it combines not only easy-to-use feature, elegance and technical support, but also includes other complementary products and services delivered by one or more firms to impact customers’ lives. Thus, to create a customer experience offer is to create an offering that is truly different. The table presented earlier in the chapter provides examples of potential elements of the novel customer experience offering.

The company faced a decision either to scale the existing UX services or create a customer experience offering. The knowledge of organisational capabilities, strategic choices and a clear specification of the desired future dealt with the confusion in the company. As a result, management was able to plan practical steps according to the desired strategy. The choice between UX services and customer experience was a choice between scaling the expansion of the existing UX business (market penetration) and differentiation by design. By choosing a differentiation by design strategy the company recognised the need for organisational development. It is a differentiation by design because customers had to recognise the difference between the two services. If they failed to perceive the uniqueness of each, they would be likely to assume that the “new”
The UX capability differentiation works when customers are able to perceive the uniqueness of the customer experience offering.

offer is a repackaged UX services. Consequently, differentiation would be meaningless from both the customers’ and company’s viewpoint. The diversification of business into customer experience requires specific skills and competences. It is a related diversification because it builds on the competences of multidisciplinary team management and creation of integrated solutions. They form a good starting position but, as the company discovered in practice, they are not enough to win new customers. It is essential task to develop new competences for the described specifications of the new worldview.

References


Brand image can help in setting UX goals

In an interview study with seven Cloud software companies we looked for high level goals for UX that companies want to provide to end-users. We asked company representatives about the brand image (the image a company wants to convey to its customers) and about the UX goals they use when designing and evaluating user experience of their products.

The most popular image that the studied companies want to convey to customers is to be a technology forerunner and pioneer, and being innovative. This answers the question “what kind of company are we?” More interesting from the UX perspective is the question “what do we want to provide for the end-user?” After studying the brand images of the seven companies, we found the following answers to the latter question, divided into functional and emotional characteristics.

What do the studied companies want to provide for the end-user?

<table>
<thead>
<tr>
<th>Functional</th>
<th>Emotional</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety</td>
<td>Value</td>
</tr>
<tr>
<td>High quality</td>
<td>Empowerment</td>
</tr>
<tr>
<td>Efficiency</td>
<td>Enrichment</td>
</tr>
<tr>
<td>Ease of use</td>
<td>Inspiration</td>
</tr>
<tr>
<td></td>
<td>Discovery</td>
</tr>
<tr>
<td></td>
<td>Protection</td>
</tr>
</tbody>
</table>
The kinds of properties listed above are good candidates for setting the UX goal for company’s products, as they resonate with end-users. The properties related to being a forerunner work better in the point of sales.

**Brand image is not often conveyed via products**

Most companies have defined a brand image that they want to convey to their customers or end-users. It is not common, however, to take the brand image into account in product development, for various reasons. For example, it does not make sense for subcontractors to convey the brand image via the products or services they do, since those are branded by their customer (or even by the customer’s customer).

“Since our customers are other companies, we rather help them in their brand building and earning logic than build our own brand.” – C1

“When we do products and services for business customers, our own brand will not be visible to the end-users.” – C4

It is also rare to ask about brand image when evaluating the system UX. Only one company out of seven asked whether the evaluated product or service is in line with the brand promise. Better means for evaluating brand-based UX are needed.

“Without exception, we do ask whether the product/service experience is according to the brand promise. We ask ‘have you heard about this company providing this service’ and how the initial image of the company fits the service experience. But it is very hard to test, since the answers are this and that.” – C7

While brand image should be in line with UX, good UX also influences brand image. One company puts the brand image improvement as the goal of UX work, instead of direct monetary benefits.

“We want to intertwine business and UX, but we see brand image improvement more important than the resulted euros: if a person spends time in the appstore, it is good for the brand.” – C6

**Holistic UX is hard to produce in the Cloud ecosystem**

From the interviews it became clear that since Cloud software companies don’t always produce all parts of a product or services themselves, they cannot fully define the UX goals themselves. Holistic UX design is impossible when the company is responsible for only one part of the system.

“Our products are components in a larger system of our client, so we are not responsible of the end-user UX as a whole.” – C5

On the other side, companies buying parts of the system from subcontractors have difficulties setting UX requirements for the individual parts.

“We are good at making technical requirements and comparisons, but how to compare UX vendors and set UX requirements for the parts we buy from them?” – C2

Subcontractors need to adjust their UX work according to the client’s needs.

“The clients’ needs are various, so we adjust the UX methods and metrics accordingly. I have given up using standard measures.” – C7
Subcontractors providing one part of the system need to use the feedback that is available to them, which is not always the best source for UX information.

“Since we provide the connection, UX is visible to us only through abnormal behaviour in the network: sometimes the source of the problem is an erroneous configuration in the terminal device.” – C3

“We listen to the beta version users’ comments on the version, although these users have a higher expertise level than an average user. Average users often do not know that our product is in their device.” – C4

Goals for superior UX

Superior UX is not gained by just removing usability bugs. The ultimate goal of superior user experience is to differentiate from the competitors and thus gain a loyal, engaged customer base. To reach this goal, it is important to set UX goals that are in line with the brand image and highlight the benefits for the end-users.

Creating superior UX is difficult without clear UX goals that clarify the goal to all stakeholders and help in keeping development on the right track.

Differentiating via UX

Companies who define the UX goals for a Cloud service can differentiate by setting UX goals that are in line with their brand image. Here, special attention should be paid on the emotional side of the circle presented in Figure 15. The properties mentioned in the brand slogans of the interviewed companies are shown in the central circle. On the outer circle, we show four properties that are likely to enable good user experience in any kind of a product. While many UX researchers agree that a product should provide the right functionality and good usability, it is still undecided what would be the universal UX goals on the emotional side.

Brand image and differentiation should guide UX goal-setting, and special attention should be paid on the emotional side.
Coordinating UX in multi-party Cloud services

Cloud services are not brought to end-users by one company (even if the user may think so); several companies provide parts of the service. It is very challenging to provide superior UX in this kind of context. Each company may have different responsibilities for the overall UX, e.g. to verify privacy and security or an efficient and reliable connection. Also, one company may provide their part to several different types of systems, each of which has a different UX goal.

The way forward is easier if there is one owner of the service that defines the primary UX goal. It is beneficial if all contributors understand the common UX goal and how their contribution serves it. As a minimum, the company defining the primary UX goal should understand the role of subcontractors in creating the holistic user experience.

Summary of setting UX goals

When developing Cloud services:
1. Set UX goal to guide Cloud service development, including when multiple parties are involved
2. Prioritise UX goals that are in line with the brand image and different from competition
3. Use UX goals as measures to evaluate UX early on and throughout the development process.

The third step may be laborious, but in the long run it may pay for itself. This may require different types of measures and methods to evaluate UX in the different phases of the product development. At the beginning of the development process the goals may be more abstract, serving as a common vision. In the later phases the UX goals should become more concrete, and they can serve as concrete measurement criteria.
The two design cases presented in the following pages illustrate how user experience has been taken into the center of the service design process. The Good Spotter case of Tieto (www.tieto.com) presents service design for sustainable shopping based on a rich set of user studies. The Liquid User Experience case of F-Secure (www.f-secure.com) provides an example of a human-centered design approach to multi-device content management.

Cloud UX Cases: 
Goods Spotter 
Liquid User Experience
Cloud UX Design Case: Goods Spotter

Introduction

Goods Spotter is a Cloud software product of the Tieto corporation. Its development is described in this chapter as an example of service design. Cloud computing is represented from an end-user point of view, based on the user experience of service design activities such as scenario creation, concept design and user evaluation in the service design stages: Discovery, Concepting, Prototyping and Testing and Implementation (Figure 16). ‘Each of the rows in the figure represents participants in the process’

The background to Goods Spotter was Tieto’s Sustainability and Traceability Intelligence Offering. Tieto aimed to expand to new customers and industries with a new Cloud service, using the novel opportunities that Cloud offers. The retail sector was selected as a starting point.

We at Tieto started planning for phenomena that were not yet widespread. We aimed at connecting our earlier work and knowledge concerning sustainability, user values and needs, the opportunities Cloud offers, e.g. storing big data somewhere in the “Cloud” and also new opportunities for near field communication (NFC), applied to customer services. Playfulness, location awareness, augmented reality, belonging to a group of daily practices or interests, sociability and different modalities such as speech and spatial gestures, were considered potential sources for creating a wow factor. This case was a learning journey for using service design and UX methods for creating a new Cloud service based on customer values. The development of a business model is part of the service design; however it has been excluded from this description.

The Goods Spotter smartphone application provides consumers with greater resources to support their purchase decisions. It gives

“Just as food products are labeled with calorie and nutritional information, consumer products are beginning to bear details about their environmental impact, like the amount of greenhouse gases produced in making, transporting and selling them.” (The New York Times (2007) “Friend of Nature? Let’s See Those Shoes”)
consumers access to additional information provided by the manufacturer so they can better assess the suitability of an item for their own needs. The application also allows consumers to share their views on the product through social media channels. The platform is flexible for sharing data on both products and services in general.

Discovery

Both preliminary UX and business ideas and first concepts were created during several brainstorming sessions. Manufacturer–customizers were ideated to be able to monitor the relevant sustainability and traceability related metrics, using this information in optimising and managing the performance of products and processes, and at the same time mitigating the cause of potential variations in their products’ footprints. It was planned that supply chain stakeholders in general (e.g. manufacturer, supplier and store) would be differentiated from their competitors by providing their clients with more information and thus decision empowerment. With easily obtained product information the eco-friendly end-consumer in store could behave more according to their own values and thereby purchase less environmentally-intensive variants of each product – so exerting their market power. Supply chain stakeholders could be able to make decisions real-time, having an immediate effect on decreasing monetary and environmental operational costs.

Scenarios were used as design tools, describing different situations and usage possibilities. Various personas were used to inspire persuasive and informative easy-to-use design, to help in finding suitable UX metrics and also to help in searching for suitable consumers for user studies. As result of brainstorming sessions, the first versions of customer and marketing personas and scenarios were written. With project group knowledge about sustainability, environmentally-aware customers and marketing, the first stereotypical end-customer persona description seemed to be realistic enough for a starting point. This was confirmed by customer studies undertaken soon after. The supposed early adaptors were environmentally aware, committed and socially-active consumers.

Figure 16. Service design activities of Goods Spotter

Prepare

Both preliminary UX and business ideas and first concepts were created during several brainstorming sessions. Manufacturer–customizers were ideated to be able to monitor the relevant sustainability and traceability related metrics, using this information in optimising and managing the performance of products and processes, and at the same time mitigating the cause of potential variations in their products’ footprints. It was planned that supply chain stakeholders in general (e.g. manufacturer, supplier and store) would be differentiated from their competitors by providing their clients with more information and thus decision empowerment. With easily obtained product information the eco-friendly end-consumer in store could behave more according to their own values and thereby purchase less environmentally-intensive variants of each product – so exerting their market power. Supply chain stakeholders could be able to make decisions real-time, having an immediate effect on decreasing monetary and environmental operational costs.

Scenarios were used as design tools, describing different situations and usage possibilities. Various personas were used to inspire persuasive and informative easy-to-use design, to help in finding suitable UX metrics and also to help in searching for suitable consumers for user studies. As result of brainstorming sessions, the first versions of customer and marketing personas and scenarios were written. With project group knowledge about sustainability, environmentally-aware customers and marketing, the first stereotypical end-customer persona description seemed to be realistic enough for a starting point. This was confirmed by customer studies undertaken soon after. The supposed early adaptors were environmentally aware, committed and socially-active consumers.
Sustainability as a value – as a practice – in reality

Benchmarking sustainability

Benchmarking started from favourable, possible and used sustainability measures, examples of actors and activities concerning sustainability and recent retail customer studies on the appreciation of sustainability. We listed and studied examples of sustainability actors and informants in Finland, universities and research institutes studying sustainability, previous sustainability studies and work done in Finland, similar scenarios and work in progress shown in academic papers and public presentations, foreign stores taking account of sustainability and online tools for sustainability self-assessment. We got a general idea about what had been already done, what was in the pipeline, opportunities, problems that might lie ahead and potential actors and informants to contact.

Consumer studies about sustainability

Nordic and Finnish consumer studies (Climate Focus Nordic, 2009; Ethos, 2010) revealed whether (food) customers were sustainable, what kind of people they were, how many there were and also whether sustainable customers were ready to act according to said values. Our customer persona Maarit was called LOHAS (a lifestyle of health and sustainability) and we identified her as LOHAS Medium – the customer segment most interested in environmental issues (Ethos 2010). Still there appeared to be a behaviour gap. Most European consumers want to be responsible citizens, but their food consumption is irresponsible. This gap is partly due to conflicting consumer goals, partly to limited awareness, attention, ability and opportunities. This gap could be bridged by reducing the conflict between sustainability and other consumer goals by means of education, information, labeling, and support (Thøgersen, 2010).

When people contemplate their values before acting they are more likely to follow through with their values. For our still largely undefined service, they seemed to be potential users. But would they really use it?

Ideate

Interviews and ideation

Further background information was received by participating in seminars and interviewing two sustainability and commerce specialists. Interviews gave a broad overview, showed potential and probable problem areas, e.g. some conflicting aims with end-customers and supply chain stakeholders. Questions were raised about the degree of openness and transparency on both sides. The results from other user studies were summarised as design drivers. The question was how to take the findings into account in the business model and later ideated functionalities? We should start simple – but would that be enough to persuade potential users to start using

The First Customer Persona

Maarit Laine is 35 years old. She has one child named Helena, 10 years old, with whom she is living. Maarit is social, active citizen; an early adopter. She is LOHAS Medium type of customer (a lifestyle of health and sustainability): environmental, climate change and ethical issues are important for her. Environmental values are close to her heart because she wants her child to have a cleaner and better place to live in. Maarit does not focus her shopping on one store chain. She uses regular customer cards (which all are in her mobile phone) whenever possible. For internet use she has a bank card and internet banking credentials. She has the internet and basic computer skills.
and to stay users of this service, to ensure the long-term user experience? UX would play a critical role.

**Concepting**

**Vote**
The first versions of scenarios were delivered on the Owela ideation platform. Owela is an online space for open innovation and participatory design. Invitations for Owela online discussion were distributed both to participants of the Food Day seminar and the Peloton Low-Carbon-Camp, organised by Demos Helsinki, Aalto University and Sitra Finnish Innovation.

**User testing in shopping centre**
After underlying work, where earlier findings were utilised to update scenarios, a simple product-tracing tool—prototyping RFID (Radio Frequency Identification) tag was created and wireframes to the sustainability dashboard were drawn. These were taken to a large shopping centre (Ideapark), to VTT’s Showroom Ihme. Ideapark is a big shopping centre where the majority of the stores concentrate on home and leisure. The interviewees, potential future users, were shop customers, spending either their leisure time or doing their weekend shopping. The prototype, wireframes and other themes shown in scenarios were validated by interviewing 21 customers during two days. The aim of the interviews was to get feedback from potential users on the Goods Spotter service proposals, more specifically to gather user feedback on current scenarios and wireframes and to ideate with potential users future possibilities for shopping behaviour that took into account eco-efficiency and social responsibility. Some of the discussions could be seen also as specialist interviews, because the sustainability theme encouraged them to make contact.

As a result of this user testing we developed further scenarios, killed some of our darlings and most of all started designing, implementing and evaluating a product-tracing pilot service as an application. With the existing wireframes we had started off at the wrong end and with a design that was far too complicated. The evolution of use had to have an easier beginning. After that the usage possibilities – functionalities in our dashboard wireframes – could be broadened, as trust was earned and the benefits of use shown.

**Design drivers**
We had studied whether there is a need or a latent need for the preliminary ideated application/s in helping retail customers to use sustainability data of products, in a way that is also economical for the service supplier, whoever that may be. A lot of sustainability-related scenarios and prototypes for the retail sector had already been done. However, real-life obstacles had stopped development: the lack of sustainability data, the lack of reliable enough sustainability data or the use product data in general, especially from different shop chains. If it were easy, the services would already have been done in real life. We believed that there would be a gap for a solution, if we just started with tiny steps, aiming not for perfect data and also using social data. Would it be easier to start collecting data from shop chain trademarks? We understood that the sustainability issues should be combined with other kinds of information on products. The design drivers for the Goods Spotter application from both Discovery-stage and Concepting-stage were found to be:

- Reliability
- Avoid fanaticism
- Avoid accusing
- Help to solve the conflict between words and actions
- Combine different points of view
- Comparativeness

As a result of this user testing we developed further scenarios, killed some of our darlings and most of all started designing, implementing and evaluating a product-tracing pilot service as an application. With the existing wireframes we had started off at the wrong end and with a design that was far too complicated. The evolution of use had to have an easier beginning. After that the usage possibilities – functionalities in our dashboard wireframes – could be broadened, as trust was earned and the benefits of use shown.
• Intuitive labeling
• Transparency relating to the product and its manufacture in terms of:
  • lifecycle
  • locality
  • ethics
• Changes in global economy
• Participation, social media
  • Openness is the future
  • People want to participate
  • The social media controls
• There are also other than the usual users, e.g.
  • Production development
  • Legislation
  • Media

Ecology, taste preferences and price are competing with each other in food-purchasing decisions. The same products have different personal weightings at different times.

The general UX guidelines for the application were stated: The basic views should be VERY simple. At the same time the app should be easy-to-use, creating hope and there should be some playfulness to bring joy, but it should be reliable as well. Different UX meters should be defined according to different target groups. To get more users we should win confidence, give pleasure and joy – also to those who are not committed to sustainable consuming.

The new persona guiding design was Tarja Tavallinen. She is concerned about sustainability issues, but more flexible and older than Maarit Laine. This persona and her family were varied using mind-maps with attributes concerning preferences and restrictions.

Prototyping and testing

Prototype

Android proto and peek inside the box proto

From studies and scenarios undertaken a list of features for design and development were derived. These were ranked according to importance.

From the end-user point of view, the aim was to empower consumers by increasing awareness and knowledge via personalised product information, including relevant sustainability and traceability-related metrics. The supporting of shopping decisions was based on the user reading product tag with their mobile phone. The producer or shop would get direct and quick feedback from the customer.

On the package, information is either too small to read or in the wrong language, consumers are not familiar with all the symbols, the same or nearly the same kind of data is shown by different symbols. How to help consumers with nearly similar labeling, how to inform them of the differences? A study was made of how different information types could and should be shown: on/off values (e.g. e-additives, fair trade, local, organic, suitable/not suitable, contain/not contain), values that should be given with something to compare (scale, e.g. carbon and water footprints) and values that should show exactly (e.g. price, distance). How to show the degree of reliability in data?

The first Goods Spotter application prototype was an RFID tag-based demo running on Android mobile devices, allowing users to view and compare detailed product information, e.g. related to sustainability, of grocery shop products. The user got personalised product information by viewing shop items with their mobile phone.

Easy personalisation is essential, if you have a lot of potential possible data to be shown. However, a first-time user should get interesting information without going through any personalisation dialogues.
phone, could rate and give feedback. The distributed software development team (university students of the Software Factory course in Helsinki and Joensuu) used agile methods, scrum and kanban. A light usability inspection by a CS UX specialist was made to this proto. Comments were gathered from trade representatives at the Myymälämessut fair.

The potential use of augmented reality (AR), to create the wow factor, were ideated in workshops. Researchers were potential users, retail customers with their own personal background. The second Goods Spotter prototype was a ‘peek inside the box’ concept that included AR and a context awareness system to view a 3D model of a product that is still inside a package, creating an illusion that the user is looking inside the box. Viewing the actual product packaging from different angles allows the user to see the model from different perspectives (see Figure 17).

Figure 17. Android prototype of Goods Spotter and the ‘peek in the box’

iPhone proto

New apps are published frequently and updated more frequently. Benchmarking is carried out by studying and testing iPhone apps that have similar user goals or type of functionalities/data: mobile shopping, recipes, shopping lists, recommendations, ratings etc. using product data from shop chain/producer/crowdsourcing, using no product data, crowdsourcing in general, tracking, location-based, AR etc. GoodGuide was found to be the closest application, but is not suitable to Finland, at least with current principles of used data. Several services were found for the same or nearly the same purpose, e.g. apps showing product data, by different shop chains, by different producers etc. There are also official, well-trusted services giving extra information. This can be also problematic for users, especially when these services have no inter-connection. There still seemed to be a place for Goods Spotter.

A working application using pure social media data of the products was considered as a starting point for a more versatile Goods Spotter app, as long as no other product information was available. Some of the second prototype’s functionality and ‘peek inside the box’ were included on an iPhone proto. This service allowed users to scan a barcode or an AR code of a product and get more information about it, e.g. reviews given by other users and AR-type product 3D information from the producer. Users could give their own reviews of the products. These reviews could include a written comment and five-star scaled ratings related to different value aspects, such as quality and ethicality. Scanning was done by pointing the camera of the mobile device on the barcode or AR code of the product. Users could add new products to the system by scanning a barcode that as yet had no data.

The aim was that the app would use the product data from producers and trusted third parties as soon as it was available. This was a showcase for selling purposes, for the possibilities of the Goods Spotter and as an example of the use of AR for products.
A UX study of the Goods Spotter iPhone prototype concentrated on understanding the general shopping situation, and the experiences as well as human values related to it. The study used qualitative research methods. It examined e.g. what values the test users (retail customers) had, how well the value aspects contained in the product matched these and what things were motivating the users. The emotions the app raised in users were studied to find out if the app was acceptable for them to use and to continue using it.

A potential conflict between social media critics and those who pay for the service was pointed out earlier in our study. This was suspected to be dependent on culture, but changing rapidly. Other questions proposed were: If there was no other data than social data, how in the beginning would it be possible to achieve a critical volume of social data to get new users? How to lure customers to add new, missing products, add ratings and comments? How to build the trust, to ensure sufficient accuracy of the social data? How to prevent aversive behaviour, offensiveness? The aim was to have basic, neutral product data and also gradually extra data produced by producers to the system, as well as to give constructive customer feedback to producers and retailers. For the planned business model that was all essential.

The UX study had a straightforward influence on the iPhone Goods Spotter v1 and had also an influence in building the brand image. E.g. logo was redesigned to be more general, having fewer connotations to sustainability. The users seemed to find the usage of the application more a positive than a negative experience from the emotional point of view. But even when in this phase the app was very simple and had little functionality, there were found to be both some usability and, in the broader context, UX problems. From an excellent UX point of view there were challenges to be solved. Better UX would ensure that consumers accepted this particular app, started and continued using it, enjoyed using it and recommended it. That would bring opportunities to build a working business model for both service providers and producers.

Implementing

**iPhone app v1 – ready for customising**

Against the background of previous service design activities, Tieto’s Goods Spotter v1 was designed and implemented as a flexible platform for sharing data for both products and services. The change and expansion from the preliminary ideas and user needs to the current view can be seen and summarised visually in the development of the Goods Spotter logo (Figure 18).

Tieto Goods Spotter v1 is a smartphone app providing detailed product and service information for consumers and participants. Access to product information together with the app’s social shopping features make evaluating alternatives and the buying decision easy. Using AR increases engagement.

**Figure 18.** From eco-friendly logo to Goods Spotter logo open to more meanings

**Figure 19.** Overview of Good Spotter service (for promotional video, see http://www.youtube.com/watch?v=LkX-Tpxnjy4)
Goods manufacturers can connect with customers and offer additional product information at the very moment when the buying decision is under consideration. They can use data about consumer behaviour and feedback to product development and focused marketing. Customers can reach their friends with feedback and comments on social media channels as well as find images, videos or other product content via their mobile phone.

The framework for each customisation is built as a customer journey map (Figure 20, retail example). So far ideated, and not totally rejected, features, have been collected and described in detail in table format, to be reminded and further ideated in our customer business cases. For prioritising purposes, each potential feature is scored according to its importance and analysed on how easy or laborious it is to implement.

Refining – profiling end-customers in new way

We had started conceptualising Goods Spotter traditionally, according to recent consumer studies, benchmarking and our own qualitative user studies. The main target group combined the themes of the ethical, ecological and socially responsible consumer. Later our aim was to broaden the target group, and get more profound and versatile knowledge about retail customers both in Finland and Sweden. The study by VTT was based on an online survey including values, demographics and context questions. The value structures were analysed; persona dimensions developed and similar structural patterns combined in clusters. Finally for each cluster a persona description was developed. This allowed end-customers to be profiled in a new way. Gathered information about user values, user needs, features and business opportunities is used in Goods Spotter development for the realisation of user values.

Customer values ground the imagination in the real world and guide the development of Goods Spotter in a new round of co-creation. We want to design experience, not only software. This means that we need to bring all interested parties around personas designed to allow them to get enthusiastic about the vision of experience. Experience is considered an “extension” of product design and thus will “just happen” for potential customer.

One of these new personas, Pia (Figure 21), is reminiscent of Maarit (see above), but is more accurately described and carries reliable information as a starting point for differentiation.

The survey-based app development by using statistical multivariate methods is a new opening, to meet better the needs of customers, to serve them better and in a more interesting way.
Goods Spotter using topical trends

With the Goods Spotter case we have studied how to implement a novel Cloud service, leaning on some of the current methods and trends of service design: value-driven user studies, user-centred design practices for new mobile platforms, gradual personalisation, the possibilities of sustainability data, near field communication, context awareness, social data, AR and automated data integration.

More precise sustainability data can be seen coming gradually to different product groups, but we can start with existing sustainability data. The information design challenge is to show the essence and comparability of e.g. carbon footprint values of different products.

A challenge in the Goods Spotter development was whose product data could be used, as it appeared that no common approach had been built in practice. The GS1 Sinfos database contains a huge amount of all kinds of products data, but the common use of it is very regulated. We created a compromise proposal, starting by products and events from some Finnish producers and companies. The Tieto Goods Spotter platform is flexible for sharing data for products and services. It has been done so far for retail, but is open for any business area, also for public sector services. "Good money" refers to the business model supporting sustainability. Desirable user experiences, also in the long term, can be created according to target customer values and latent needs as the basis for future experiences, not only according to existing customer needs. The aim relating to sustainability constructively became one of producing hope, giving the means for behaviour change, according to the values of potential customers.

As the mobile devices and platforms develop we have been riding on a running horse. The Goods Spotter vision build along this service design journey is described in Figure 22. And the ride continues.

Excellent UX will be reached with real, timely delivered information served as easy-to-use and with innovative information and user interface designs. By serving the end-users well, business value for customers will be obtained.
Cloud UX Design Case: Liquid User Experience

F-Secure has conducted extensive research into the user experience (UX) in the Cloud programme. The main reason was to understand how we should change our thinking to ensure that in the future we provide meaningful services and a great experience to our end users.

Experience Service Innovation

F-Secure has a history of protecting digital lives for over 20 years using Internet security applications and services for computers and mobile devices. At the beginning of its Cloud software programme, F-Secure made a strategic decision to broaden its product portfolio from the ‘install and forget’ type of security towards more active value propositions in the form of content storage, sharing and synchronisation through a secure-content Cloud.

Hence, the company’s current product portfolio also includes personal Cloud services for consumers’ irreplaceable digital content. There have also been other major changes in the company’s strategy. Instead of being directly geared towards consumer markets, the main business model of the company is to partner with Internet service providers and mobile operators and offer security and storage products as part of the broadband operators’ service packages. All these issues were the critical drivers behind the research conducted by F-Secure, VTT and Tampere University of Technology (TUT).

Liquid UX in this context means the ability to access a familiar service or content, conveniently and securely, from anywhere, via different devices and platforms.
The research into the Cloud software programme for a liquid UX can be divided into three categories (see Figure 23):

1. Studies focusing on the Cloud context
2. Studies focusing on human values
3. Studies focusing on the use of the services and value-in-use

We started with a contextual understanding in 2010

The first study concentrated on the following questions:
- What gives a user a good experience of security in a Cloud environment?

We recognised that context understanding is really necessary. Hence, we need to understand:
- How do people in different countries use Cloud services?

And related to a very F-Secure specific way of thinking, we wanted to understand especially:
- How do people perceive security in Cloud services?

We conducted an end-user survey online in three countries (Finland, USA and Japan) with more than a thousand respondents in each country. The survey also included questions that we could use to identify lead users in the sample. The identified lead users will be involved in following phases of the research when we will continue with a qualitative study to understand and identify (future) end-user expectations, requirements and ideas to give a superior UX of Cloud security.

As a second step, we wanted to gain rich data through qualitative research and we tried out the Owela research environment. This approach gave F-Secure a deep understanding of the importance of the perception of security in the Cloud. By applying user-driven innovation and identifying end-user expectations, the requirements and ideas necessary to give a superior user experience of Cloud security were gathered.

VTT’s online innovation space, Owela, was used as a continuous communication channel between company representatives and end users. Two different groups of users of Cloud services were compared: lead users and basic users. A wide range of online user involvement methods were used: discussions, commenting, blogs, idea posting, and idea chats.
Understanding user values in the Cloud context in 2011

The first phase opened our eyes and structured the next step in forming a solid understanding of the Cloud UX. We started to concentrate more on what users really value in the Cloud context.

A central solution was the ViEx (Values in Experience, Sirotkin et al., 2013) methodology, which begins with an imperative that designing for experience originates from experience, not technology. To help management and developers adopt a new perspective, the ViEx methodology identifies data-driven persona dimensions and personas that quickly lead to an understanding of the desired experiences. ViEx methodology has six steps:

- Surveying customer values in a specific context
- Analysing value structures and developing persona dimensions
- Combining similar structural patterns into clusters
- Developing a persona description for each cluster
- Integrating personas and persona dimensions into the organisation's activities
- Evaluating results and customer perceptions

VTT conducted a 3000 person consumer study with F-Secure in 2011 to probe the values of broadband and mobile operators’ subscribers globally. Using the Values in Experience methodology, we developed distinctive consumer personas, which can be used in value-added service business development, concept design and marketing. We had one crucial building block in place, namely the segmentation dimensions and personas. This opened the door for the following research activities for our current products and product ideas.

From users’ values and personas towards user-centred development of our services in 2011-2012

First, we took one of the new concept ideas driven by the values and personas of the Cloud users, and researched it. The first service concept from this exciting phase was the Safe Home product.

Safe Home concept was the first “guinea pig” service

The goal of the next study was to identify the desired and expected value perceived by end customers for the Safe Home solution considering all of its tangible and intangible features. Safe Home is a security solution for homes and all home devices based on hardware and design innovations.

VTT’s Owela online platform was used to conduct a five-week study of almost 70 consumers during October and November 2011. Altogether the study generated over 3000 comments from the participating consumers. The discussion was analysed weekly, providing F-Secure with rapid results that were integrated into the simultaneous software development. The study produced a number of insights, resulting in several improvements to the new service before its com-
mercial launch. The information was shared with F-Secure’s Internet service provider partners, who found it valuable. The study produced many new ideas for Cloud services, and they will be analysed further to see if they can be developed as new services by F-Secure.

Long-term user research into Cloud content services

The Owela co-design platform was used as the main research environment for 60 people participating over eight weeks. The study was designed to collect data on each of three inter-related elements that describe the different states of a consumer’s perception of the value of the service: desired value, expected value and value-in-use. During the first week of the study, the participants discussed and wrote about their general opinions on sharing and storing their digital content. In the second week, their expectations and thoughts of the marketing material describing the Content Anywhere solution were collected. Content Anywhere is a service that lets end users store, sync and share their content across their devices – desktops, tablets, mobiles and TVs. It is a private and secure Cloud for a user’s photos, videos, music and files, accessible on any device, anytime, anywhere.

Finally, the last six weeks were spent in gathering the participants’ experiences of their actual use of the service with their own devices in a real-life context. In addition to this research using Owela, traditional research methods like focus groups were used to increase our understanding of participants’ thinking and their mental model of the expected Cloud storage services.

The results of this long-term study ranged from identifying minor usability glitches to shedding light on some of the fundamental questions related to the value proposition of the service. A massive amount of data were collected during the study, including 71 narratives, well over 1000 theme-based discussion comments and about 1000 votes from polls. Deep insights into the expectations and behaviour of people while using online storage, sharing and syncing services for their irreplaceable content were derived from the data. This narrative pool is a particularly remarkable source of insights that F-Secure can continue to use in the future.

As the final phase of the Liquid UX adventure, we modelled and tried a totally new concept

The Liquid Memories demo was an exciting design exploration of a new Cloud service (see Figure 25). The focus was to determine the users’ real values, as well as how the narrative approach can be used to create a basis for services. Liquid Memories is a platform-wide working demo with a simple use case based on real user narrative research. This demo has an example of future services and explains how we will need more services and software that really derive from users’ natural requirements and fulfil their expectations for everyday digital life.
So in the end, was this Liquid experience research journey useful?

The end result of the whole journey can be seen as a great new start for the coming adventures in the development of better Cloud services giving a unique user experience. F-Secure has already used these results in several ways. The following picture shows examples of the motivation for studying different aspects of context, values and use.

In summary, the main benefits from the Liquid experience research are the strategic insights into user values and requirements and how they can be built into Cloud service development (see Figure 26). Systematic research into context, values and use has given us a deep understanding of our customers. We can use these observations constantly, both today and in future, when improving our solutions to better serve our customers.

Figure 25. Liquid Memories prototype.

Figure 26. The Liquid Experience case utilised strategic understanding of contexts, user values and use.

Further reading

Concluding words

User experience in the Cloud is a multifaceted phenomenon. In this book we have shared some of our findings and insights from the end-users’, developers’ and business managers’ points of view. Creating successful Cloud services requires understanding of user needs, values and practices, and matching the design of innovative services to them. Furthermore, the developing companies also need to carefully consider the role of user experience in their business logic and service delivery processes.

From the end-user’s perspective, the Cloud offers many benefits: No software updates need to be performed and the user always has the latest service version available. The Cloud offers unlimited memory and backup and the services are available at any time and anywhere (except when there is no connection). The service offering is vast and the user decides which service to use. The Cloud has unique opportunities to offer “wow” experiences to users through the dynamically changing content and service functionality, as well as careful aesthetic design. At the same time, some risks can be seen: When connectivity failures happen, the user is not able to continue their task – which may lead to severe frustration. There can be a real or perceived loss of security and privacy. Cloud services do not have established user interface conventions and therefore may be harder to learn. Finally, because of the vast offering the user may get lost in the “service space”. Still, the benefits are often bigger than the potential drawbacks.

One of the core special issues when developing Cloud services with delightful user experience as a target is the emphasis on social experiences through features for on-line interaction that can truly connect people. Another key aspect is enabling fluent task transfer and coherent experience between multiple devices, including mobile phones, tablets and PCs. In addition, users need to feel safe in the Cloud – they should always have a strong sense of privacy and data control. The new services should fit into existing user practices, and we as developers must take care that new services fit into the ecosystem of the existing ones – keeping in mind that “no service is an island”.

The on-line nature of the Cloud itself presents special opportunities for conducting user research in the Cloud with much larger user bases than has been possible in traditional user research. This will help more effective time-to-market as well as more acceptable and successful services through co-creation with the end-users.

We hope that this book has offered inspiration to you, the reader, and landmarks for the development of Cloud services with superior user experience. Our own experiences of creating this book in the Cloud were mostly very positive. Not just because the on-line material was always accessible to everyone (through Google Drive), but also because we met face-to-face in three “bookathons” to write the majority of the texts. Sociability is important, flavoured with some solitary moments of focussed productivity. On the next page, you can see some of our moments of creativity, productivity, and fun while writing this book.
Biographies of the authors

Marjo Jaakola is working as a UX researcher with Ericsson and doing post-graduate studies in usability and software development at Aalto University. Marjo has 14 years experience in telecom product development and is one of the UX drivers at Ericsson Finland. Marjo’s research interests include voice user interfaces in the call context and the user centred design process when end-users and the customer are involved.

Kaarina Karppinen MSc has been a research scientist at VTT Technical Research Centre of Finland since 2005. Her research interests lie in the areas of user experience, user studies and on-line co-design; with specific focus being on the end-user perception of information security. She is doing her dissertation for the University of Oulu.

Kaisa Koskela-Huotari MSc (Econ & Bus Adm) has been a research scientist at VTT Technical Research Centre of Finland since 2008 and is currently a visiting scholar at the Shidler College of Business, at the University Hawaii at Manoa. Her main research interests include service-dominant logic, value co-creation, service innovation, consumer behaviour and on-line co-design. She is doing her dissertation for the University of Oulu.

Raija Kuusela PhD has almost 30 years experience in the ICT sector. She has been working as a senior research scientist at VTT Technical Research Centre of Finland since 2009. In her research and consulting work she has been focussing on lean thinking from different perspectives such as lean transformation, methods, and implementation. Before her VTT employment, Raija worked for Nokia for 14
years in several roles in the software domain including development, management and leadership. She was one of the agile pioneers at Nokia. Raija received her PhD in Industrial Engineering and Management from the University of Oulu, Finland in 2007.

Kati Kuusinen is a doctoral student in the department of Pervasive Computing, at Tampere University of Technology (TUT), Finland. Kati’s doctoral research topic is Agile UX – how user-experience work should be integrated in agile software development practices. The emphasis of the research is to develop ways of working that constantly lead to desired user experience in a short time to market. Kati has six years experience in research of human-centred software development in the software and automation industries. Previously, Kati worked in industry as a software developer, project manager and requirements engineer for six years.

Ville Nore MSc is working as UX leader of the corporate business line at F-Secure Corporation. He has more than 14 years experience in user-experience, user-centric-design, service-design and user-experience research in Finnish companies like Nokia, Digia and F-Secure. During his career he has worked on UX research projects on nearly every continent. For example, in addition to Finland, he has worked in North America, many European countries, Japan, Malaysia and India.

Jarmo Palviainen M.Sc. is a teaching fellow pursuing his doctoral degree at Tampere University of Technology (TUT), in the department of Pervasive Computing. His research topic is user experience and sociability in the context of cloud services. His earlier work has included the usability of automation systems, strategic usability (integrating usability activities in the product development processes) and the relation between software architecture and usability.

Päivi Romppanen MSc, MA specialises in user-centred design and user experience at Tieto, having worked long years for the public sector. She has 20 years experience with usability and 10 years experience with UX and service design. She is actively involved in method development and is especially interested in UX issues related to meanings and values.

Virpi Roto PhD is a post-doctoral researcher in the Department of Design at Aalto University, Helsinki. During her 15-year career at the Nokia Research Centre, she developed her mission of making user-experience work in industry more systematic. Her expertise covers methods for user-experience evaluation, experience design, and experience-driven innovation.

Andrey Sirotkin has more than 11 years experience in ICT. He has been working as a research scientist at VTT since February 2010 and focusing on PhD research in customer experience and business strategy. Before that he was a cofounder of Nautilus IT, a Russian company that focussed on ERP, CRM and financial systems implementation. He progressed from a position as analyst to division director during his eight-year tenure. Before that Andrey headed the Foreign Investments Division of the Department of Foreign Affairs at Irkutsk regional government. He received an MBA with distinction from Brookes University (Oxford) in 2009.

Sari Vilminko MSc has more than 15 years experience in ICT. Her main interest areas are user experience design, service design, customer-oriented value creation, lean leadership and coaching leadership. She has worked in the public sector and industry. Vilminko worked in the user-experience business area as interaction designer, UX lead and senior project manager at Digia Plc. Before that teaching, e-learning, project management and research on customer-
value creation were her main focus areas in the public sector. Since May 2013 Vilminko has worked at Diaconia University of Applied Sciences, specialising in RDI and project management, where she continues with user-centred service design and creation. She acted as industrial co-lead in the Cloud Software Program’s user-experience work area until October 2012 and she is a co-editor of this book.

**Kaisa Väänänen-Vainio-Mattila** is Professor of Usability and User Experience, in the Department of Pervasive Computing, at Tampere University of Technology (TUT), Finland. At TUT, Kaisa leads the Human-Centred Technology Unit, which focuses on research into mobile, ubiquitous and Cloud user experiences. Kaisa has 20 years experience in research, related to human-computer interaction of novel systems, at university and in industry, including 10 years with Nokia Inc from 1995 to 2004. Kaisa’s research interests cover user experience and human-centred design in product development, with emphasis on design and evaluation of mobile and ubiquitous interaction. Kaisa is a co-editor of this book.
Cloud services are used daily by millions of people for communicating, content sharing and storage, gaming and media consumption. The way people experience Cloud services is critical to user acceptance and eventual success of these services. As technology and service developers, we need to design these services to enable meaningful, fluent, pleasant and rewarding use. This book has three main parts addressing different facets of Cloud services. The first part sheds light on end-users’ perceptions of the Cloud. The second part takes the developer’s viewpoint and presents issues which can help design Cloud services with superior user experience. The last part discusses how UX can give rise to new business in the Cloud. These parts aim at providing “landmarks” to what is important in Cloud UX development – and how to make Cloud services successful.